The Bendheim Center for Finance

ANNUAL REPORT
2004

Princeton University
## CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Director’s Introduction</td>
<td>5</td>
</tr>
<tr>
<td>Faculty</td>
<td>11</td>
</tr>
<tr>
<td>Visiting Faculty</td>
<td>33</td>
</tr>
<tr>
<td>Visiting Fellows</td>
<td>36</td>
</tr>
<tr>
<td>Graduating Ph.D. Students</td>
<td>37</td>
</tr>
<tr>
<td>Finance Seminars</td>
<td></td>
</tr>
<tr>
<td>Civitas Foundation Finance Seminar Fall 2003</td>
<td>38</td>
</tr>
<tr>
<td>Civitas Foundation Finance Seminar Spring 2004</td>
<td>38</td>
</tr>
<tr>
<td>Conferences</td>
<td>39</td>
</tr>
<tr>
<td>The Princeton Lectures in Finance</td>
<td>39</td>
</tr>
<tr>
<td>Oxford-Princeton Workshop on Financial Mathematics &amp; Stochastic Analysis</td>
<td>39</td>
</tr>
<tr>
<td>Energy Risk Conference</td>
<td>41</td>
</tr>
<tr>
<td>Political Economy of Financial Markets Conference</td>
<td>42</td>
</tr>
<tr>
<td>BCF Finance Industry Seminar Series</td>
<td>43</td>
</tr>
<tr>
<td>Undergraduate Certificate in Finance</td>
<td>45</td>
</tr>
<tr>
<td>Departmental Prizes, Honors and Athletic Awards to UCF ’04 Students</td>
<td>46</td>
</tr>
<tr>
<td>Senior Theses of the Class of ’04</td>
<td>47</td>
</tr>
<tr>
<td>Mini-Course on Financial Modeling, Valuation and Analysis Using Excel</td>
<td>49</td>
</tr>
<tr>
<td>Master in Finance</td>
<td>50</td>
</tr>
<tr>
<td>Admission Requirements</td>
<td>50</td>
</tr>
<tr>
<td>Statistics in the Admission Process</td>
<td>51</td>
</tr>
<tr>
<td>Program Requirements</td>
<td>51</td>
</tr>
<tr>
<td>Core Courses</td>
<td>52</td>
</tr>
<tr>
<td>Elective Courses</td>
<td>52</td>
</tr>
<tr>
<td>Tracks</td>
<td>55</td>
</tr>
<tr>
<td>Some Course Descriptions</td>
<td>56</td>
</tr>
<tr>
<td>Master in Finance Placement Record</td>
<td>59</td>
</tr>
<tr>
<td>Advisory Council</td>
<td>61</td>
</tr>
<tr>
<td>Corporate Affiliates Program</td>
<td>62</td>
</tr>
<tr>
<td>2004-05 Members</td>
<td>62</td>
</tr>
<tr>
<td>Levels and Benefits</td>
<td>62</td>
</tr>
<tr>
<td>Gift Opportunities</td>
<td>63</td>
</tr>
<tr>
<td>Acknowledgements 2003-04</td>
<td>64</td>
</tr>
</tbody>
</table>
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 faculty members, representing six different departments, are currently affiliated with the BCF. Our newest hire is Alexandre d’Aspremont, who is joining our faculty this summer as an Assistant Professor in the Department of Operations Research and Financial Engineering. Professor d’Aspremont received his undergraduate degree from École Polytechnique in France in 1997 and his Ph.D. from Stanford University in 2003. His thesis was entitled “Shape Constrained Optimization, with Applications in Finance and Engineering.” Before joining Princeton, he taught at Berkeley for one year. At Princeton, he will be teaching ORF 311: Optimization under Uncertainty and ORF 515: Asset Pricing II: Stochastic Calculus and Advanced Derivatives.

Undergraduate Certificate in Finance
Now in its sixth year, the Undergraduate Certificate in Finance continues to do extremely well. We enrolled 155 juniors from the Class of 2006, an increase from the numbers of the previous years (Class of ’00: 61; ’01: 82, ’02: 85; ’03: 122, ’04: 135; ’05: 141), bringing our total number of undergraduate students in the program (juniors and seniors) to 296 this year.

Students earning the UCF are drawn from a wide cross-section of departments on campus, testifying both to the interdisciplinary flavor of the program and its wide appeal. In addition, UCF students are an extremely talented subgroup of the already high-achieving Princeton classes. They continue to receive an extraordinary proportion of the prizes awarded by their respective departments. All together, in 2004, 71 UCF students or
63% of the 113 graduating certificate recipients received departmental prizes, honors, athletic awards or some combination of all three.

Four UCF students received a combination of departmental prizes and honors and athletic awards:
• John Paul Ference (Operations Research and Financial Engineering or ORFE): cum laude in ORFE, and Gordon Sikes Medal for light weight crew
• Elliot Holland (Civil and Environmental Engineering): Mack Angus Prize for best student in CEE, summa cum laude, and George J. Mueller Award for Athletics
• Brian Kirshbaum (Politics): cum laude in Politics, Gifford Trophy for Wrestling and Treide Trophy for Wrestling
• John Lugner (History): Joline Prize in American History and summa cum laude in History and Class of 1916 Athletic Award

Seventeen UCF students received departmental prizes and honors:
• Daniel Brand (Economics): Senior thesis prize in finance and magna cum laude in Economics
• Joanna Deitch (Economics): Senior thesis prize in finance and magna cum laude in Economics
• Jing Ge (Computer Science): Phillip Goldman ’86 Prize in Computer Science and summa cum laude
• Benjamin Handel (Computer Science): Applied and Computational Mathematics Independent Project Prize, magna cum laude in Economics
• Philippe Inagaki (Physics): Allen Shenstone Prize in Physics and magna cum laude
• Robert Mulcare (Woodrow Wilson School): George Mitchell Scholarship and Lieutenant John Larkin Memorial Prize and summa cum laude in WWS
• Avinash Rao (ORFE): Kenneth Condit Prize and summa cum laude in ORFE
• Jonathan Sagal (Philosophy): Class of 1869 Prize in Ethics and summa cum laude
• Joshua Saltman (ORFE): Kenneth Condit Prize and summa cum laude in ORFE
• Austin Saypol (Economics): Wolf Balleisen Memorial Prize for best thesis, Halbert White ’72 Prize for best Economics student and summa cum laude in Economics
• Parag Shah (Electrical Engineering): John Ogden Bigelow Prize in Electrical Engineering and cum laude in Electrical Engineering
• Adam Shukovsky (ORFE): Frank Castellana Prize in ORFE and summa cum laude in ORFE
• Anthony Sun (Electrical Engineering): David Forney Prize and summa cum laude in Electrical Engineering
• Brian Tiang (Computer Science): Accenture Prize, Phillip Goldman ’86 Prize in Computer Science and James Hayes-Edgar Palmer Prize in Engineering (across entire Engineering) and summa cum laude
• Lauren Washchlyn (Economics): Halbert White ’72 Prize for best economics student and summa cum laude in Economics
• Amy Wu (Economics): Daniel Rubinfeld ’67 Prize for best empirical thesis, cum laude in Economics
• Ashley Zohn (Sociology): Isidore Brown Academic Achievement Award and Isidore Brown Thesis Award and summa cum laude in Sociology

Five UCF students received athletic awards:
• Jonathan Kieliszak (Electrical Engineering): Bonthron Trophy for Wrestling
• William Onnato (ORFE): George McFarland Squash Award
• George Pilcher (ORFE): Richard Colman-Scholar-Athlete Award
• Tim Releford (ORFE): Class of ’52 Football Award
• Juan Valdivieso (Woodrow Wilson School): Dermot Quinn Memorial Swimming Award, War Memorial Trophy (Swimming) and member of 2004 Olympic Peruvian National Swim Team

Finally, 45 UCF students received some form of honors (23 cum laude, 14 magna cum laude and 8 summa cum laude).

**Master in Finance**

The second full class of the Center’s Master in Finance (MiFin) graduated in June 2004. Reflecting the interdisciplinary nature of the BCF, the MiFin 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.

Because business schools do not generally offer so specialized a program, or expect their students to have such a strong mathematical background, Princeton’s MiFin 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.

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. We intend to continue keeping the program small and selective.

MiFin applications for 2004-05 continued at the high pace of approximately 200 applicants. We admitted 19 students this year, and 9 will be enrolling this coming fall. Our selectivity rate continues to be exceptionally high, with our program admitting less than 10% of its applicant pool. This is a substantially smaller percentage than our peer programs in quantitative finance (NYU, Columbia, Carnegie-Mellon, Berkeley, Chicago, etc.) and one that is comparable to the most selective business schools. 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 to 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.

In fact, MiFin was so 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. As a result, we will be repeating the experiment in September 2004, with the “boot camp” likely to become a permanent fixture of the MiFin program.

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 have been reflected in a strong demand for our 2004 graduates, all of whom found permanent employment in top financial institutions at least six months before their graduation.

**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. Eight students graduated in 2004. 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.

- Dries Darius graduated from the Department of ORFE. His thesis "Optimal Investment under the Constant Elasticity of Variance Model" was written under the direction of Professor Ronnie Sircar. He will continue his career at Citigroup.
- Valdo Durrleman graduated from the Department of ORFE. His thesis deals with the relationships between implied and spot volatilities and was written under the supervision of Professor René Carmona. He will be pursuing his career at Stanford University as a Szego Assistant Professor in the mathematics department.
- Aytaç İlhan graduated from the Department of ORFE. Her thesis deals with hedging exotic options in incomplete markets and was written under the supervision of Professor Ronnie Sircar. She will be pursuing her academic career as a post-doctorate fellow at Oxford University.

- Umit Kaya graduated from the Department of Economics. His thesis deals with corporate governance and was written under the supervision of Professor Patrick Bolton. He will be pursuing his career as a consultant working for Mercer, Oliver, Wyman.
- Bruce Preston received his Ph.D. from the Department of Economics. His thesis "Adaptive Learning and the Use of Forecasts in Monetary Policy" was written under the supervision of Professors Jonathan Parker and Michael Woodford. He is now an Assistant Professor at Columbia University in the Economics Department.
- Adam Purzitsky graduated from the Department of Economics. His thesis deals with jump-diffusion and random field models of the term structure of interest rates and was written under my supervision. He will begin a career in fixed income research at Lehman Brothers.
- Koray D. Simşek graduated from the Department of ORFE. His thesis deals with applications of stochastic programming in multi-stage financial planning and was written under the supervision of Professor John Mulvey. He will be pursuing his career as an Associate Professor at EDHEC Business School in Nice, France.
- Jialin Yu graduated from the Department of Economics. His thesis deals with financial econometrics and applications to the exchange rate in China and robust financial decision making. It was written under my supervision. He will be pursuing his career as an Assistant Professor in the finance department at the Graduate School of Business at Columbia University.

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 13, 2004. The agenda was centered on the placement of future Master students, 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.

Yacine Aït-Sahalia
Otto A. Hack ’03 Professor of Finance and Economics
Director, Bendheim Center for Finance
August 2004
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.

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:

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 575/FIN 575: Topics in Financial Economics

Graduate students advised:
• Adam Purzitsky, “Empirical Issues in Modeling the Term Structure”
• Jialin Yu, “Saddlepoint Methods in Finance”

Representative publications:
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. He is the editor of the American Economic Review. He earned his Ph.D. from the Massachusetts Institute of Technology in 1979.

Ben S. Bernanke

Representative publications:

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 Financial Markets

Undergraduate students advised:
• Joseph Looke, “Entrepreneurism Corrupted: An Analysis of the Fall of Enron”
• James Tieng, “Reforming the Boardroom: Sarbanes-Oxley, Board Independence and Firm Performance”
• 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)

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 130: Modern Financial Markets

Undergraduate students advised:
• Jeffrey A. Micsky, “Primary Market Pricing of High Yield Debt in a Recessionary Environment”
• Gianfranco Tripiccio, “The Effects of Mortgage Convexity Hedging on Long Term Interest Rates”

Alan Blinder is the Gordon S. Rentschler Memorial Professor of Economics. He is also the 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 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: The National Economy
• WWS 595a: The Political Economy of Central Banking

Representative publications:
• Downizing in America, Russell Sage Foundation, 2005 (with W. Baumol and E. Wolff).
Patrick Bolton is the John H. Scully ’66 Professor of Finance and Economics at Princeton University. Professor Bolton has both a Ph.D. in Economics and an M.Sc. in Mathematical Economics and Econometrics from the London School of Economics. He is a Fellow of the Econometric Society, and a Fellow of CEPR, ECGI and NBER. He is a member of the Editorial Board of the Journal of Financial Intermediation, and a previous member of the Editorial Boards of Econometrica, Annales d’Economie et de Statistique and Economic Policy. He is a managing editor of the Journal of the European Economic Association (JEEA) and a former Managing Editor of the Berkeley Electronic Journals in Theoretical Economics and the Review of Economic Studies. Professor Bolton’s main research interests are in contact theory, corporate finance, political economy and industrial organization.

Courses taught:
- ECO 526/FIN 596: Financial Economics II
- ECO 541: Industrial Organization and Public Policy
- ECO 542: Regulation of Industry and Antitrust Policy

Undergraduate students advised:
- Stephen Fleming, “Research and Development during the Technology Boom of the Late 1990s: Does the Source of Financing Matter?”

Graduate students advised:
- Sylvain Champomnois
- Wioletta Dziuda
- Andrei Hagiu, “Platforms, Pricing, Commitment and Variety in Two-Sided Markets”
- Umit Kaya
- Marc Martos-Vila
- Chunhui Miao
- Elod Takats
- Jeongon Yun

Representative publications:

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. He 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, limits to arbitrage, 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 attack it. In his work on financial crisis and risk management, he shows that “predatory trading” exacerbates a liquidity crisis and can cause systemic risk. His current research proposes a shift away from the rational expectations paradigm towards “optimal expectations.” His research won him a spot on the prestigious Review of Economic Studies Lecture Tour in 1999 and has been supported by grants from the National Science Foundation, the European Union, Economic & Social Research Council, and Economica.

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

Representative publications:

René Carmona, Paul 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 “Aggregation” of Mathematics (federal degree) in June 1989, and a “Thèse d’État” 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, and energy trading and risk management.

Courses taught:
- ORF 505/FIN 505: Regression and Time Series
- ORF 551/FIN 551: Computational Finance in C++
- ORF 577: Malliavin Calculus and Applications to Finance
- ORF 574: Special Topics in Investment Science

Undergraduate students advised:
- Kelly Gaydos
- Katherine Milkman
- Alison Weingarden

Graduate students advised:
- Albina Danilova, “Indifference Pricing for Weather Derivatives”
- Valdo Durrleman, “Pricing Spreads”
Representative publications:
• “Pricing and Hedging Spread Options,” SIAM Review, forthcoming (with V. Durrleman).
• Statistical Analysis of Financial Data in Sphs.

Patrick Cheridito received his Ph.D. from ETH Zurich (Switzerland) in 2001 and visited universities in Vienna (Austria), Paris (France), Barcelona (Spain) and Pisa (Italy) 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 (ETH, Zurich, Switzerland) and Robert Kimmel (Bendheim Center) he worked on affine models for interest rates. With Mete Soner (Koc University in Istanbul, Turkey) and Nizar Touzi (Crest in Paris, France) he studied the problem of hedging contingent claims under gamma constraints. With Freddy Delbaen and Michael Kupper (both ETH Zurich, Switzerland) he studied dynamic risk measures.

Courses taught:
• ORF 435: Financial Risk Management
• ORF 535: Financial Risk Management
• ORF 527: Stochastic Calculus and Finance

Undergraduate students advised:
• Hendrik Chasse, “Hedge Funds: When and Where to Invest”
• Melissa Maquilan, “An Analysis of Expected Shortfall as a Method of Measuring Risk in Credit Portfolios”
• Adam Shukovsky, “Hedging European Options in the Presence of Transaction Costs”

Graduate students advised:
• Jaewon Choi, “Credit Risk Model with Lagged Information on the Firm”

Representative publications:

Courses taught:
• ECO 340: The Chinese Economy

Representative publications:

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 399: Probability and Stochastic Systems
• ORF 526: Stochastic Modeling
• ORF 511/ASC 521: Probability Theory
• ORF 554: Markov Processes
• ORF 557: Stochastic Analysis Seminar

Undergraduate students advised:
• Warren Cheng, “Identifying Inefficiencies in Current Methods of Determining Baseball Contracts”
• Avinash Rao, “Credit Risk Extensions to the Markovian Model”

Representative publications:
• Nihil Patel
• Vincent Samat
• Mike Ludtковski, “Convenience Yield: Estimation and Model Calibration”
• Lixin Wang, “Applications of the Malliavin Calculus to the Analysis of Stochastic Partial Differential Equations”

Courses taught:
• ORF 535: Financial Risk Management
• ORF 557: Stochastic Analysis Seminar

Undergraduate students advised:
• Jaewon Choi, “Credit Risk Model with Lagged Information on the Firm”

Representative publications:
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. He is a member of Institute for Operations Research and the Management Sciences (INFORMS), Society for Industrial and Applied Mathematics (SIAM), 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:
- Mashiko Egami
- Kinga Elo (Visiting Student Research Collaborator)
- Semih S. Sezer

Representative publications:

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 1995-2003, according to Science Watch. 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 analysis, likelihood theory, nonparametric tests, generalized linear models, analysis of longitudinal data, and model selection.

Courses taught:
- ORF 569/FIN 569: Statistical Theory and Methods
- ORF 560/FIN 560: Financial Econometrics
- ORF 561/FIN 561: Advanced Financial Econometrics
- ORF 570/FIN 570: Financial Econometrics

Representative publications:
- Local Polynomial Modeling and Its Applications

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 555: Fixed Income Models
- FIN 505/ORF 515: Asset Pricing II: Stochastic Calculus and Advanced Derivatives
- FIN 605/ORS 605: Modern Derivatives

Undergraduate students advised:
- Kate Barber, "A Rounding Model for Option Pricing"
- Michelle Breyer, "Extendible Options: Pricing and Analysis"
- Namish Jain, "Real Options: A Comparative Evaluation of Existing Models"

Graduate student advised:
- Milda Darguzaite

Representative publications:

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 415/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:

Daniel Kahneman is the Eugene Higgins Professor of Psychology and Professor of Public Affairs in the Woodrow Wilson School since 1995. He is the co-recipient of the 2002 Nobel Prize in Economics. He is a member of the National Academy of Sciences, and in 2002 received (together with his late colleague Amos Tversky) the prestigious Gravemeyer 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 526/WWS 529: Negotiation, Persuasion, and Social Influence: Theory and Practice
- WWS 345/PSY 349: Concepts of the Human Agent: Implications for Policy
- WWS 502: Psychology for Policy Analysis and Implementation

Representative publications:

**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 415/FIN 515: Portfolio Theory and Asset Management
- ECO 421/FIN 521: Fixed Income Models and Applications
- FIN 502: Corporate Finance and Financial Accounting

Representative publications:

**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 1999 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 324: Advanced Macroeconomics: Domestic Policy Issues

Representative publications:

**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 317: Financial Markets

Undergraduate students advised:
- Joanna Dettch, "Defining the Concept of the Value Stock: Book-to-market versus Price-to-earning, Dividend Yield, and Earnings Growth"

Representative publications:

**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
- ORF 524: Special Topics; Hedge Funds
- ORF 531: Optimization Under Uncertainty
- WWS 515: Financial Planning Models

Undergraduate students advised:
- Avery Kiser
- Suzanna Sanchez
- Yippy Wong

Graduate students advised:
- Batur Bicer, “Modeling Synthetic Organizations via Financial Engineering”
- Ozugan Karakas, “Volatility Strategies for Hedge Funds”
- Koray Simsek, “Integrating Pension and Financial Planning”
- Jamie Thompson, “Optimizing Non-parametric Models for Hedge Funds”

Representative publications:
- "Evaluating a Trend Following Commodity Index for Multi-period Asset Allocation," *Journal of Alternative
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 Sellow 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 Economics 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 Macroeconomics I
- ECO 562: Topics in Development
- WWS 522c: Macroeconomic Analysis Advanced

Representative publications:

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 first came to Princeton as a Visiting Scholar in April 1998; she returned in 2000 as an Assistant Professor. 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 II

Graduate students advised:
- Deniz Igan
- Alejandro Justiniano
- Jordi Mondria
- Thomas Wu

Representative publications:
Undergraduate students advised:

- 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”

Representative publications:


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 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 346: Latin American Economics
- ECO 502: Microeconomic Theory
- ECO 525/FIN 595: Finance Theory I
- ECO 526: Finance Theory II

Representative publications:

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:

K. 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 as an Assistant Professor. He became an Associate Professor in July 2004. He has been the recipient of National Science Foundation research grants during the period 1998-present. He was a first-time recipient of the E-2, 1-60, 2002.

Courses taught:
- ORF 335/ECO 335: Introduction to Financial Engineering
- ORF 515: Stochastic Calculus for Finance & Engineering
- ORF 557: Financial Engineering Seminar: Computational Finance

Undergraduate students advised:
- Eric Tonkyn, “Empirical Analysis of Sniping on eBay”

Representative publications:
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:

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 the Massachusetts Institute of Technology, he was the Gilbert W. Winslow Career Development Professor and served as the Director of the Civil Engineering Systems Methodology Group. He held visiting appointments at Harvard University and the University of Louvain (Belgium), his undergraduate alma mater, and was the Shimizu Corporation Visiting Professor at Stanford University. His principal expertise is in engineering 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

Representative publications:

Michael Woodford is the Harold H. Helm ’29 Professor of Economics and Banking. He received a J.D. from Yale Law School in 1980 and his Ph.D. in Economics from the Massachusetts Institute of Technology in 1983. He taught at Columbia University and the University of Chicago before joining the Princeton faculty in 1995, and is also a Fellow of the Econometric Society and Research Associate of the National Bureau of Economic Research. He was awarded a John Simon Guggenheim Fellowship in 1998-99. He has written extensively in the areas of intertemporal general equilibrium theory, business cycle theory, and monetary economics. His current

Undergraduate students advised:
- Matthew Busssmann, “Vulnerability of Tall Buildings to Progressive Collapse: Case of Petronas Towers in Kuala Lumpur, Malaysia”

Representative publications:

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: Econometrics II

Undergraduate students advised:
- Austin Sappol, “Structural Change in Residential Housing Finance and the Dampering of National Output Fluctuations”

Representative publications:

Undergraduate students advised:
- Matthew Bussmann, “Vulnerability of Tall Buildings to Progressive Collapse: Case of Petronas Towers in Kuala Lumpur, Malaysia”

Representative publications:

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: Econometrics II

Undergraduate students advised:
- Austin Sappol, “Structural Change in Residential Housing Finance and the Dampering of National Output Fluctuations”

Representative publications:

Michael Woodford is the Harold H. Helm ’29 Professor of Economics and Banking. He received a J.D. from Yale Law School in 1980 and his Ph.D. in Economics from the Massachusetts Institute of Technology in 1983. He taught at Columbia University and the University of Chicago before joining the Princeton faculty in 1995, and is also a Fellow of the Econometric Society and Research Associate of the National Bureau of Economic Research. He was awarded a John Simon Guggenheim Fellowship in 1998-99. He has written extensively in the areas of intertemporal general equilibrium theory, business cycle theory, and monetary economics. His current
research deals primarily with the theory of monetary policy.

Undergraduate student advised:
• Daniel Ahn, “The Economic Effects of Uncertainty on Long-term Growth”

Graduate students advised:
• Gauti Eggertsson, “Policies to Deal with a Liquidity Trap”
• Andrea Tambalotti, “Optimal Monetary Policy and Technological Progress”
• Zhen Li, “Financial Liberalization and Growth”
• Fabio Milani, “Learning and Inflation Inertia”

Representative publications:
• *Handbook of Macroeconomics* (Editor), Amsterdam: North-Holland, 3 volumes, 1999 (with J. Taylor).

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 was invited by the *Review of Economic Studies* to present his research on its annual European tour in 2000.

Courses taught:
• ECO 422/FIN 522: Futures, Options and Other Derivatives
• ECO S500: Mathematics for Economists

Undergraduate students advised:
• Brian Cayne, “Tech & The LBO: A Compatibility Test”
• Matthew Chunn, “Debt or Equity Markets: Liberating the Capital Account in Emerging Markets”
• Peter Coffin, “Informed Trading Around Earnings Announcements: Evidence from the Options Market”
• Ananya Lodha, “Examining Mezzanine Debt and Junk Bond Debt in Leveraged Buyouts”
• David Sackler, “Analyzing the Efficient Market Hypothesis: Macro to Micro”
• Cyrus Whitney, “All Falls Down: A Look at Currency Crises Past and Future”

Representative publications:

During the academic year 2003-04, the BCF welcomed the following visiting faculty:

**Sugato Bhattacharyya** visited us during the 2004 spring term. He is an Associate Professor of Finance at the University of Michigan Business School. He received an MBA from the Indian Institute of Management in 1980 and his Ph.D. from Harvard University in 1990. Dr. Bhattacharyya’s main interests include corporate finance, game theory, and industrial organization.

Course taught:
• ECO 518: Corporate Finance

**Louis P. LaGuidera** is a Visiting Lecturer in the Department of Economics and has been associated with the Bendheim Center for Finance since 2003. He has been the instructor and preceptor in the University’s accounting course, Economics 333, serving students in a number of concentrations ranging from economics, finance and financial engineering to public policy, history, and the life sciences. He is an adviser to seniors and juniors in their independent research and has given several lectures and seminars on accounting to students ranging from freshmen to degree candidates in the Master in Finance Program. He was previously an adjunct Assistant Professor at Columbia Business School, Columbia University, where he offered courses in introductory accounting and accounting for derivatives. At Columbia he was the Coopers and Lybrand Scholar and a Chazen Institute research award winner; prior to that he was a member of the Price Waterhouse program at Cornell University’s Johnson School. He has pursued his academic and professional interest in the fields of risk management, capital markets and financial instruments for over 27 years. He received his Ph.D. and M.Phil. from Columbia in 1998, his M.B.A. from the University of Virginia in 1981 and his A.B. from Princeton in 1977. He holds a CPA (New York) and is a member of the American Accounting Association and the American Institute of Certified Public Accountants.

Courses taught:
• ECO 333: Financial Accounting
• WWS 582e: The Accounting and Management Process in the Public Sector

Undergraduate students advised:
• Inger Løfgren, “Navigating the Quest for Value. An EVA Analysis of the Global Tanker Industry”
• Joseph Looke, “Entrepreneurism Corrupted: An Analysis of the Fall of Enron”
• Mark Smith, “An Examination of General Electric’s Financial Transparency”
• Spencer Smith, “The Use of Financial Ratios in Predicting Environments of Earnings Manipulation”
• Lauren Washyyn, “Does Expensing Stock Options Cause Share Prices to Decline?”

**John Quigley** has been teaching his *Venture Capital & Private Equity Investing* (ECO 417/FIN 517) seminar at Princeton for seniors and M.Fin. students each fall since 2001. Mr. Quigley has been part of the Princeton community since 1995, when he helped launch Nassau Capital, the independent firm established to manage the private portion of the University’s endowment. Mr. Quigley has headed Nassau’s direct investment program since the firm’s inception. Mr. Quigley has over twenty years of experience in the private equity investment business. He began his career in 1980 as an attorney with Kirkland & Ellis in Chicago. Thereafter he was a founder of buyout sponsor Adler & Shaykin in New York, where he was a partner throughout the 1980s LBO boom. As the 1990s commenced, Mr. Quigley took an “academic sabbatical” as a Ph.D. candidate in an interdisciplinary economics program at Columbia. He returned to the investment business in 1992 to help establish
Clipper Capital Partners, an independent merchant banking fund sponsored by Crédit Suisse First Boston. Mr. Quigley is a graduate of Georgetown (A.B., summa cum laude, 1976), Stanford (J.D., M.B.A., 1980) and Columbia (M.Phil., 1992). He is presently on the boards of KMC Telecommunications, Inc. (Vice Chairman); ComHealth Inc.; Dry Bulk Shipping (BVI) Limited; and The Audax Group. He has previously served as a director of a number of companies, as well as on the advisory boards of several private-equity investment firms. Before teaching at Princeton, Mr. Quigley had taught at Columbia Law School and NYU’s Stern School of Business throughout the 1990s. He is a member of the Stanford Law School Dean’s Strategic Council. Mr. Quigley conducts new investment and philanthropic activities through two entities which he has established, Kewco, L.L.C. and The Civitas Foundation.

Course taught
• ECO 417/FIN 517: Venture Capital & Private Equity Investing

Undergraduate students advised
• Daniel E. Freuman, “The LBO: Unleashing the Forces of Creative Destruction”
• Brian R. Kirschbaum, “The Regulation of Private Equity: Lest We Become Unwitting Victims of the Darkness”
• Jonathan Berger, “Hedge Funds: Risk-return Profiles of Hedge Fund Styles: A Performance Comparison”

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 419/FIN 519: Corporate Restructuring
VISITING FELLOWS

The Center welcomed the following visiting fellows during the academic year 2003-04:

Marco Bonomo is Associate Professor of the Graduate School of Economics of the Getulio Vargas Foundation, Rio de Janeiro, Brazil. He spent the academic year 2003-04 at the Bendheim Center for Finance. His research interests include short-run macroeconomic effects, with emphasis on the role of microeconomic pricing, asset pricing, and political business cycles. He received his Ph.D. from Princeton University in 1992.

Representative publications:

Andre Monteiro received his Ph.D. from Catholic University of Rio de Janeiro (PUC-Rio) in 2002 and wrote his thesis on term structure of interest rate models. The focus of his research interest is finance and international macroeconomics. He also worked as chief economist and risk manager of Icatu Investment Bank during 1999-2002. He spent the academic year 2003-04 at the Bendheim Center for Finance. During this period, he worked on two issues: The first one is the term structure of country risk premium. He proposes an alternative country-risk-premium term structure based on non-arbitrage assumption behind the currency-risk-adjusted covered interest parity. The alternative curve possesses some financial and statistical advantages compared to the usual sovereign-bond-based curve. The second issue is categorization, a choice strategy well-documented by psychological literature. He proposes a multidimensional standard rational preference structure that incorporates imperceptible difference on a finite set whose elements are described by n attributes. Imperceptible difference is modeled by similarity. The idea of category naturally arises in this formulation. This preference structure is then used to normatively analyze categorization. He has been working on the application of this framework on the problem of portfolio selection. After the end of his visiting period at BCF, he joined Gavea Investments.

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. Eight students graduated in 2003-04.

Dries Darius graduated from the Department of ORFE. His thesis “Optimal Investment under the Constant Elasticity of Variance Model” was written under the direction of Professor Ronnie Sircar. He will continue his career at Citigroup.

Valdo Durrleman graduated from the Department of ORFE. His thesis deals with the relationships between implied and spot volatilities and was written under the supervision of Professor René Carmona. He will be pursuing his career at Stanford University as a Szegö Assistant Professor in the Mathematics Department.

Aytac Ilhan graduated from the Department of ORFE. Her thesis deals with hedging exotic options in incomplete markets and was written under the supervision of Professor Ronnie Sircar. She will be pursuing her academic career as a post-doctorate in Oxford University.

Umit Kaya graduated from the Department of Economics. His thesis deals with corporate governance and was written under the supervision of Professor Patrick Bolton. He will be pursuing his career as a consultant working for Mercer, Oliver, Wyman.

Bruce Preston received his Ph.D. from the Department of Economics. His thesis “Adaptive Learning and the Use of Forecasts in Monetary Policy” was written under the supervision of Professors Jonathan Parker and Michael Woodford. He is now an Assistant Professor at Columbia University in the Economics Department.

Adam Purzitsky graduated from the Department of Economics. His thesis deals with jump-diffusion and random field models of the term structure of interest rates and was written under the supervision of Yacine Aït-Sahalia. He will begin a career in fixed income research at Lehman Brothers.

Koray D. Simsek graduated from the Department of ORFE. His thesis deals with applications of stochastic programming in multi-stage financial planning and was written under the supervision of Professor John Mulvey. He will be pursuing his career as an Associate Professor working for EDHEC Business School in Nice, France.

Jialin Yu graduated from the Department of Economics. His thesis deals with financial econometrics and applications to the exchange rate in China and robust financial decision making. It was written under the supervision of Professor Yacine Aït-Sahalia. He will be pursuing his career as an Assistant Professor working for the finance group at the Columbia University Business School.
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 2003

September 17 Martin Cherkes
Princeton University

“*A Positive Theory of Cloud-end Funds as an Investment Vehicle*”

September 24 David Skee
Princeton University

“Electronic Money and Banking”

October 1 Guraj Banker
University of Maryland

“Book Values, Earnings, and Market Valuations”

October 8 Wayne Person
Boston College

“Evaluating Bond Government Fund Performance with Stochastic Discount Factors”

October 22 Tzelela Zarithopoulou
University of Texas at Austin

“Pricing Algorithms and Portfolio Choice in Incomplete Markets”

November 5 Jennifer Carpenter
New York University

“Portfolio Performance and Agency”

November 12 Roman Inghert
London School of Economics

“Credit Risk Analysis and Security Design”

November 19 Mark Davis
Imperial College

“Optional Investment with Randomly Terminating Income”

December 3 Dimitri Vigano
Massachusetts Institute of Technology

“Flight to Quality, Flight to Liquidity, and the Pricing of Risk”

December 10 Nicole El Karout
École Polytechnique

“Optional Derivatives Design under Dynamic Risk Measures”

Civitas Foundation Finance Seminar Spring 2004

March 3 Pete Kyle
Duke University

“Strategic Acquisitions and Investments in a Duopoly Patent Race under Uncertainty”

March 10 Torben Andersen
Northwestern University

“Some Like it Smooth, and Some Like it Rough: Untangling Continuous and Jump Components in Measuring, Modeling, and Forecasting Asset Return Volatility”

March 31 Steve Heston
University of Maryland

“Options and Bubbles”

April 7 Saghetti Bresciani
University of Michigan

“Marketing to Market Tending Activity, and Mutual Performance”

April 14 Steve Kaplan
University of Chicago

“Private Equity Performance Returns, Persistence and Capital Flows”

April 21 David Scharfstein
Harvard Business School

“Organizational Scope and Investment: Evidence from the Drug Development Strategies of Biopharmaceutical Firms”

April 28 Jessica Wachtel
New York University

“The Declining Equity Premium: What Role Does Macroeconomic Risk Play?”

May 5 Dean Karlan
Princeton University

“Fitting Ostriches to the Mast: Evidence from a Commitment Savings Product in the Philippines” (joint with the Behavioral Economics Seminar)

May 10-11-12 Bill Sharpe
Stanford University

“2004 Princeton Lectures in Finance, Asset Prices and Portfolio Choice: Lecture 1, Equilibrium; Lecture 2, Diversify, Lecture 3, Protection”

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 2004 *Princeton Lectures in Finance* were given by William Sharpe, Professor Emeritus at Stanford University, the 1990 Nobel Laureate in Economics, on the topic of “Asset Prices and Portfolio Choice”:

- Lecture 1: Equilibrium, Monday May 10
- Lecture 2: Diversity, Tuesday May 11
- Lecture 3: Protection, Wednesday May 12

The 2005 *Princeton Lectures in Finance* will be given by Douglas Diamond of the University of Chicago. 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. 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.

Oxford-Princeton Workshops on Financial Mathematics & Stochastic Analysis

The first workshop took place on October 17-18, 2002 (at Princeton) and the second on March 19-21, 2004 (at Oxford). They are part of the Oxford-Princeton collaboration and are designed for an informal exchange of ideas between the Mathematical Finance group at Oxford and the Financial Engineering group at Princeton. The next workshop will take place at Princeton in 2006.

Speakers and Participants
- Raymond Brummelhuis, Birkbeck College, University of London
- René Carmona, Princeton University
- Álvaro Cartea, Birkbeck College, University of London
- Damien Challet, University of Oxford
- Miriam Cisneros, University of Oxford
- Michael Dempster, University of Cambridge
- Andrew Dickinson, University of Oxford
- Valdo Durleman, Princeton University
- Marcelo Figueroa, Birkbeck College, University of London
- Neil Firth, University of Oxford
- Adrian Geller, London School of Economics
- Ben Hamby, University of Oxford
- Vicky Henderson, Princeton University
- David Hobson, Princeton University and University of Bath
- Sam Howison, University of Oxford
- Aytac Ilhan, Princeton University
-

38 BENDHEIM CENTER FOR FINANCE A N N U A L R E P O R T 2 0 0 4 3 9
• Diego Jiménez-Huerta, London School of Economics
• Tino Kluge, University of Oxford
• Mike Ludkovski, Princeton University
• Terry Lyons, University of Oxford
• Andrea Maccarini, Kings College London
• S. Malik, Ukraine
• Elena Medova, University of Cambridge
• Michael Monoyios, Brunel University
• John Mulvey, Princeton University
• Chris Potter, University of Oxford
• Alet Roux, University of Hull
• William Shae, University of Oxford
• Koray Simsek, Princeton University
• Ronnie Sircar, Princeton University
• H. Mete Soner, Koç University
• Krzysztof Tokarz, University of Hull
• Jeannette Woerner, University of Göttingen
• Tomasz Zastawniak, University of Hull

Program
Friday March 19, 2004
10.30-11.00 Aytac Ilhan, 10.00-10.30 Koray Simsek, 10.30-11.00 (Break)
11.00-11.30 Mike Ludkovski, 11.00-12.00 René Carmona, 11.00-12.00 (Break)
12.00-12.30 Vicky Henderson, 12.00-12.30 (Break)
12.30-13.00 Lunch
13.30-14.00 Tino Kluge, 13.30-14.30 (Break)
14.00-14.40 Damien Challet, 14.00-14.40 Álvaro Cartea, 14.00-15.20 (Break)
15.20-16.00 Vicky Henderson, 15.00-16.00 (Break)
16.00-16.10 Damien Challet, 15.30-16.30 (Break)
16.10-16.50 Ronnie Sircar, 16.00-16.30 (Break)
16.50-17.30 Thomas Zastawniak, 16.30-17.00 Vicky Henderson, 16.00-17.00 (Break)
17.30-18.10 Krzysztof Tokarz, 17.00-18.00 (Break)
18.10-18.40 (Break)
18.30-19.10 John Mulvey, 18.00-19.00 (Break)
19.30-20.10 (Break)
20.00-20.20 (Break)

Saturday March 20, 2004
9.30-10.00 Chris Potter, 10.30-11.00 Valdo Durdleman, 11.00-12.00 René Carmona, 12.00-12.30 Mike Ludkovski, 12.30-13.00 Lunch, 13.30-14.00 Tino Kluge, 14.00-14.40 Álvaro Cartea, 14.40-15.20 Ben Hambly, 15.20-16.00 (Break)
16.00-16.10 Sam Howison, 15.30-16.30 (Break)
16.10-16.50 Ronnie Sircar, 16.00-16.30 (Break)
16.50-17.30 Damien Challet, 16.00-17.00 (Break)
17.30-18.10 Vicky Henderson, 17.00-18.00 (Break)
18.10-18.40 (Break)
18.30-19.10 John Mulvey, 18.00-19.00 (Break)
19.30-20.10 (Break)
20.00-20.20 (Break)

Program
Monday March 21, 2004
10.30-11.00 Aytac Ilhan, 10.00-10.30 Koray Simsek, 10.30-11.00 (Break)
11.00-11.30 Mike Ludkovski, 11.00-11.30 (Break)
11.30-12.00 Lunch
12.30-13.00 Lunch
13.00-14.00 Tino Kluge, 13.00-14.00 (Break)
14.00-14.40 Damien Challet, 14.00-14.40 Álvaro Cartea, 14.40-15.20 Ben Hambly, 15.20-16.00 (Break)
16.00-16.10 Sam Howison, 15.30-16.30 (Break)
16.10-16.50 Ronnie Sircar, 16.00-16.30 (Break)
16.50-17.30 Thomas Zastawniak, 16.00-17.00 (Break)
17.30-18.10 Krzysztof Tokarz, 17.00-18.00 (Break)
18.10-18.40 (Break)
18.30-19.10 John Mulvey, 18.00-19.00 (Break)
19.30-20.10 (Break)
20.00-20.20 (Break)

Energy Risk Conference
The second workshop in the energy risk series, organized by René Carmona and co-sponsored by the Bendheim Center for Finance, took place on Friday, October 10, 2003, in the Friend Center, rooms 103 and 104.
In the last two years, the U.S. electric and natural gas markets have dramatically deteriorated. A booming business at the cutting edge of innovation and financial research has disappeared, leaving an industrial sector struggling for survival and deserted by disgruntled investors.
The initial efforts at electric deregulation in the United States have generally been viewed as a failure or, at best, incomplete. Deregulation was promoted as a direct route to lower, fairer and more understandable prices. Instead, it is generally acknowledged that after deregulation, retail prices often went up, small consumers had less pricing leverage than larger consumers, and pricing structures and industry rules were incomprehensible other than to a small minority of market participants. Finally, corruption, unprecedented price volatility, and service disruptions ensued after deregulation. The state of California was the first state in the nation to enact electric power restructuring. We know now that its original competitive market design did not work, and this failure continues to cast doubt over the status of electric power deregulation across the United States. The initial drive towards deregulation has been reversed in many states which have cited the California debacle as the main reason for their decision to rethink their plans to open the electric power markets to competition. The blackout of 2003 has created another dramatic reason for rethinking the theory and rationale for deregulation. Despite the failure of the California experiment, the Federal Energy Regulatory Commission (FERC) is still committed to opening electricity markets. Indeed, the FERC continues to push for new policies and new market designs. The purpose of this workshop is to bring together policy makers, regulators, business representatives, consumer advocates and academicians to address these issues in an independent setting.

Program
8:30-8:50 a.m. Welcome, Opening Remarks
8:50-9:00 a.m. Keynote Speaker: Vernon L. Smith, George Mason University, 2002 Nobel Laureate in Economics: “Electricity Market Success Requires Deregulation Down to the End-User Outlet Plug”
9:15 a.m.-12:15 p.m. — Panel #1: The Structure of the Electricity Markets — Past, Present and Future — and the Resulting Implications for Market Participants
• Chair: Pete Cartwright, Founder and CEO of Calpine Co.
— What are the implications of the California experience and the blackout of 2003 for the future of electric deregulation?
— Is timely national retail electric deregulation feasible or must we wait for state by state action?
— Can resident and small commercial consumers benefit from retail deregulation?
— Can retail electricity deregulation lead to non-discriminatory electric consumption reductions?
• David Freeman, Chairman of the California Power Utility (CPU)
• Jimmy Glotfelty, Senior Policy Advisor of the DoE Secretary
• Nettie Hoge, Executive Director, TURN
• James Sweeney, Professor, Stanford University

Panel #2: Energy Trading & Risk Management
— Why have so many merchant generators failed financially?
— In retrospect, did trading have a positive impact on the electric markets?
— Can retail electricity deregulation lead to non-discriminatory electric consumption reductions?
• Robert Willig, Professor, Woodrow Wilson School, Princeton University

Panelists
• David Freeman, Chairman of the California Power Utility (CPU)
• Jimmy Glotfelty, Senior Policy Advisor of the DoE Secretary
• Nettie Hoge, Executive Director, TURN
• James Sweeney, Professor, Stanford University
• Robert Willig, Professor, Woodrow Wilson School, Princeton University

Panel #1: The Structure of the Electricity Markets — Past, Present and Future — and the Resulting Implications for Market Participants
• Chair: Pete Cartwright, Founder and CEO of Calpine Co.
— What are the implications of the California experience and the blackout of 2003 for the future of electric deregulation?
— Is timely national retail electric deregulation feasible or must we wait for state by state action?
— Can resident and small commercial consumers benefit from retail deregulation?
— Can retail electricity deregulation lead to non-discriminatory electric consumption reductions?
• David Freeman, Chairman of the California Power Utility (CPU)
• Jimmy Glotfelty, Senior Policy Advisor of the DoE Secretary
• Nettie Hoge, Executive Director, TURN
• James Sweeney, Professor, Stanford University
• Robert Willig, Professor, Woodrow Wilson School, Princeton University
How should energy trading companies be organized and capitalized in the future?

Panelists:
- Paul Addis, CEO, Louis Dreyfus Energy
- Dan Gates, Managing Director, Moody's
- Vineet Kaminski, Senior Vice-President, Reliant

Friday, 3:40–5:00 p.m.  Session 3: Capital Intensive Investments in the Electric Market
- Chair: Joseph S. Fichera, CEO, Saber Partners LLC
  - Can portfolio risk in the electric markets be adequately quantified?
  - Can long dated merchant portfolio financial risk be adequately controlled?
  - How should merchant generation be financed in the future?
  - Do adequate incentives and regulations exist to assure transmission and distribution investments in the future?

Panelists:
- René Carmona, Professor, Princeton University
- Robert Hoglund, Managing Director, Citigroup
- Rodney Miller, Managing Director, Crédit Suisse First Boston (CSFB)
- Richard P. O’Neill, Chief Economic Advisor, FERC

Friday, 12:30–2:00 p.m. Lunch

Friday, 2:00–5:00 p.m. Session 2
- Discussants, William Clark, NYU and Sudipto Bhattacharya, LSE.

Friday, 9:30–12:30 p.m. Session 1
- Discussants, Alberto Bennardo, UCLA and Salerno.

Friday, 9:00 p.m. Lunch

Saturday, 1:00–4:00 p.m. Session 4
- Bruno Biais, Université de Toulouse, and Thomas Mariotti, LSE and Université de Toulouse, "Credit, Wages, and Bankruptcy," Discussant: Alberto Bennardo, UCLA and Salerno.

Saturday, 7:00 p.m. Dinner

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 29, 2003: "Hedge Funds 101." Andrew Greenberg of Citadel Investments, Managing Director of Global Event Driven Investing, is responsible for the oversight of the North American Risk Arbitrage and Equity Restructuring Portfolios, which includes portfolio selection, research and trading.

October 20, 2003: "Does ECO317 Translate into the Real World?" Alan Brown, Group Chief Investment Officer at State Street Global Advisors, looked at the future of fund management, briefly discussed the question of active vs. passive management, and encouraged students to think about the equity risk premium.

November 10, 2003: "How to Find a Senior Thesis Topic in Finance or ‘Quantitative Equity Research: How Wall Street Applies Academic Research to Make Money in Stocks.” Dr. Matthew Rothman, senior analyst at Sanford Bernstein, covered why investors’ greed, fear, stubbornness, inability to understand the length and trajectory of a trend or the most basic rules of probability theory is a good thing for those who are quantitatively inclined. He focused exclusively on the equity markets, discussing how good ideas are put into practice, what distinguishes a good idea from a bad idea, and how academic research has found its way to Wall Street.

December 8, 2003: "Early Stage Venture Capital," Kef Kasdin ’83, General Partner, Battelle Ventures spoke on what to look for in a Business Plan, who’s the customer, what’s their problem/pain, how is it being solved today, how can NewCo solve their problem significantly better, what’s the value proposition to the customer, how big is the market, is there competition, is the management experienced in the market, and is there a valid business model? This talk was particularly useful for participants in the Business Plan Contest.

November 24, 2003: "How to Write a Business Plan." Kent Horyhuk, General Partner with Twilight Venture Partners, LLC, a venture capital firm focused on early-stage life science investments.

March 1, 2004: "A Different Kind of Investment Banking: Muni Bonds at a Regional Firm." John Rose ’72, President and CEO of Seattle-Northwest Securities Corporation, discussed his experience in investment banking as an underwriter of municipal bonds at a regional firm. He described the work life of an investment banker working with governmental agencies in the sale of municipal bonds to finance a variety of public projects. He stressed that the rewards and lifestyles are very different from Wall Street corporate finance, but the intellectual challenge is still strong.


What distinguishes a good idea from a bad idea, and how academic research has found its way to Wall Street.

Saturday, 7:00 p.m. Dinner

PROGRAM
Friday 9:30–12:30 p.m.  Session 1

Friday 12:30–2:00 p.m.  Lunch

Friday 2:00–5:00 p.m.  Session 2

Friday 7:00 p.m.  Dinner

Saturday 9:00–12:00  Session 3
- Thursday, 12:30–2:00 p.m. Lunch
- Saturday, 1:00–4:00 p.m. Session 4
- Bruno Biais, Université de Toulouse, and Thomas Mariotti, LSE and Université de Toulouse, "Credit, Wages, and Bankruptcy," Discussant: Alberto Bennardo, UCLA and Salerno.

Saturday 7:00 p.m. Dinner

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 29, 2003: "Hedge Funds 101." Andrew Greenberg of Citadel Investments, Managing Director of Global Event Driven Investing, is responsible for the oversight of the North American Risk Arbitrage and Equity Restructuring Portfolios, which includes portfolio selection, research and trading.

October 20, 2003: "Does ECO317 Translate into the Real World?" Alan Brown, Group Chief Investment Officer at State Street Global Advisors, looked at the future of fund management, briefly discussed the question of active vs. passive management, and encouraged students to think about the equity risk premium.

November 10, 2003: "How to Find a Senior Thesis Topic in Finance or ‘Quantitative Equity Research: How Wall Street Applies Academic Research to Make Money in Stocks.” Dr. Matthew Rothman, senior analyst at Sanford Bernstein, covered why investors’ greed, fear, stubbornness, inability to understand the length and trajectory of a trend or the most basic rules of probability theory is a good thing for those who are quantitatively inclined. He focused exclusively on the equity markets, discussing how good ideas are put into practice, what distinguishes a good idea from a bad idea, and how academic research has found its way to Wall Street.

December 8, 2003: "Early Stage Venture Capital," Kef Kasdin ’83, General Partner, Battelle Ventures spoke on what to look for in a Business Plan, who’s the customer, what’s their problem/pain, how is it being solved today, how can NewCo solve their problem significantly better, what’s the value proposition to the customer, how big is the market, is there competition, is the management experienced in the market, and is there a valid business model? This talk was particularly useful for participants in the Business Plan Contest.

November 24, 2003: "How to Write a Business Plan." Kent Horyhuk, General Partner with Twilight Venture Partners, LLC, a venture capital firm focused on early-stage life science investments.

March 1, 2004: "A Different Kind of Investment Banking: Muni Bonds at a Regional Firm." John Rose ’72, President and CEO of Seattle-Northwest Securities Corporation, discussed his experience in investment banking as an underwriter of municipal bonds at a regional firm. He described the work life of an investment banker working with governmental agencies in the sale of municipal bonds to finance a variety of public projects. He stressed that the rewards and lifestyles are very different from Wall Street corporate finance, but the intellectual challenge is still strong.

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. For non-Economics or ORFE majors only, if there is no possibility of finance content in their senior thesis, a separate, shorter piece of independent work is required instead.

Now in its sixth year, the Undergraduate Certificate in Finance continues to do extremely well. We enrolled 155 juniors from the Class of 2006, an increase from the numbers of the previous years (Class of ‘00: 61, ‘01: 82, ‘02: 85, ‘03: 122, ‘04: 135, ‘05: 141), bringing our total number of undergraduate students in the program (juniors and seniors) to 296 this year.

Also encouraging is the fact that the 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 ‘04
Total number of certificates awarded: 113 (35 to women or 31%)

<table>
<thead>
<tr>
<th>MAJOR</th>
<th>NUMBER OF STUDENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Art and Archeology</td>
<td>1</td>
</tr>
<tr>
<td>Computer science (COS)</td>
<td>4</td>
</tr>
<tr>
<td>Economics</td>
<td>48</td>
</tr>
<tr>
<td>Engineering (other than ORFE and COS)</td>
<td>9</td>
</tr>
<tr>
<td>English</td>
<td>1</td>
</tr>
<tr>
<td>History</td>
<td>3</td>
</tr>
<tr>
<td>Mathematics</td>
<td>2</td>
</tr>
<tr>
<td>Operations Research and Financial Engineering (ORFE)</td>
<td>30</td>
</tr>
<tr>
<td>Philosophy</td>
<td>2</td>
</tr>
<tr>
<td>Physics</td>
<td>1</td>
</tr>
<tr>
<td>Politics</td>
<td>5</td>
</tr>
<tr>
<td>Sociology</td>
<td>1</td>
</tr>
<tr>
<td>Woodrow Wilson School</td>
<td>6</td>
</tr>
</tbody>
</table>
In addition, UCF students are an extremely talented subgroup of the already high-achieving Princeton classes. They continue to receive an extraordinary proportion of the prizes awarded by their respective departments. All together, in 2004, 71 UCF students or 63% of the 113 graduating certificate recipients received departmental prizes, honors, athletic awards or some combination of all three.

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

- John Paul Ference (Operations Research and Financial Engineering or ORFE): cum laude in ORFE, and Gordon Sykes Medal for light weight crew
- Elliot Holland (Civil and Environmental Engineering): Mack Angus Prize for best student in CEE, magna cum laude in CEE, and George J. Mueller Award for Athletics
- Brian Kirshbaum (Politics): cum laude in Politics, Gifford Trophy for Wrestling and Treide Trophy for Wrestling
- John Nuger (History): Joline Prize in American History and magna cum laude in History and Class of 1916 Athletic Award

Seventeen UCF students received departmental prizes and honors:

- Daniel Brand (Economics): Senior thesis prize in finance and magna cum laude in Economics
- Joanna Deitch (Economics): Senior thesis prize in finance and magna cum laude in Economics
- Jing Ge (Computer Science): Phillip Goldman ’86 Prize in Computer Science and magna cum laude
- Benjamin Handel (Computer Science): Applied and Computational Mathematics Independent Project Prize, magna cum laude in Economics
- Philippe Inagaki (Physics): Allen Shenstone Prize in Physics and magna cum laude
- Robert Muckle (Woodrow Wilson School): George Mitchell Scholarship and Lieutenant John Larkin Memorial Prize and magna cum laude in WWS
- Anvinash Rao (ORFE): Kenneth Condit Prize and magna cum laude in ORFE
- Jonathan Sagal (Philosophy): Class of 1869 Prize in Ethics and magna cum laude
- Joshua Saltman (ORFE): Kenneth Condit Prize and magna cum laude in ORFE
- Austin Sarpol (Economics): Wolf Balleisen Memorial Prize for best thesis, Halbert White ’72 Prize for best economics student and magna cum laude in Economics
- Parag Shah (Electrical Engineering): John Ogden Bigelow Prize in Electrical Engineering and magna cum laude in Electrical Engineering
- Adam Shukovsky (ORFE): Frank Castellana Prize in ORFE and magna cum laude in ORFE
- Anthony Sun (Electrical Engineering): David Forney Prize and magna cum laude in Electrical Engineering
- Brian Tang (Computer Science): Accenture Prize, Phillip Goldman ’86 Prize in Computer Science and James Hayes-Edgar Palmer Prize in Engineering (across entire Engineering) and magna cum laude
- Lauren Washchyn (Economics): Halbert White ’72 Prize for best Economics student and magna cum laude in Economics
- Amy Wu (Economics): Daniel Rubinfield ’67 Prize for best empirical thesis, magna cum laude in Economics
- Ashley Zohn (Sociology): Isidore Brown Academic Achievement Award and Isidore Brown Thesis Award and magna cum laude in Sociology

Five UCF students received athletic awards:

- Jonathan Kieliszak (Electrical Engineering): Bonthron Trophy for Wrestling
- William Osnato (ORFE): George McFarland Squash Award
- George Pilcher (ORFE): Richard Colman-Scholar-Athlete Award
- Tim Releford (ORFE): Class of ’52 Football Award
- Juan Valdivieso (Woodrow Wilson School): Dermot Quinn Memorial Swimming Award, War Memorial Trophy (Swimming) and member of 2004 Olympic Peruvian National Swim Team

Finally, 45 UCF students received some form of honors (23 cum laude, 14 magna cum laude and 8 summa cum laude).

Senior Theses of the Class of ’04

This table shows the titles of a selection of senior thesis titles from the Undergraduate Certificate in Finance class of 2004:

<table>
<thead>
<tr>
<th>Name</th>
<th>Thesis Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Naim Abdullah</td>
<td>Failure of Governance: A Case Study on Worldcom, Inc.</td>
</tr>
<tr>
<td>Pyoungryn Ahn</td>
<td>The Economic Effects of Uncertainty on Long-term Growth</td>
</tr>
<tr>
<td>Brandon Ashe</td>
<td>Using Monte Carlo Simulation to Determine the Exercise and Price of Bermuda Options</td>
</tr>
<tr>
<td>Christian Asmar</td>
<td>Time as Money: Applying Financial Risk Metrics to Shortest Path Problems</td>
</tr>
<tr>
<td>Christopher Baker</td>
<td>Capacity Constraints in Repeated Competitions: An Extended Game Theory Approach to Duopoly</td>
</tr>
<tr>
<td>Kate Barber</td>
<td>A Rounding Model for Option Pricing</td>
</tr>
<tr>
<td>Elizabeth Bell</td>
<td>The Effects of Revenue Sharing and Salary Caps on Competitive Balance and Financial Profitability within Professional Sports Leagues</td>
</tr>
<tr>
<td>Sandhya Bondada</td>
<td>Modeling the Impact of Funding on Tuberculosis Control in India</td>
</tr>
<tr>
<td>Eric Boosin</td>
<td>Music Sales in the Age of File Sharing</td>
</tr>
<tr>
<td>Daniel Brand</td>
<td>The Method of Payment in Mergers &amp; Acquisitions: Determinants and Stock Price Impact</td>
</tr>
<tr>
<td>Michelle Jennifer Breyer</td>
<td>Extendible Options: Pricing and Analysis</td>
</tr>
<tr>
<td>Brian Carre</td>
<td>The Other Workforce: A Study of the Illegal Immigrant Day Labor Market</td>
</tr>
<tr>
<td>Warren Cheng</td>
<td>Identifying Inefficiencies in Current Methods of Determining Baseball Contracts</td>
</tr>
<tr>
<td>Elliot Choi</td>
<td>The Effects of Unofficial Dollarization and United States Monetary Policy on Latin American Stock Market Returns</td>
</tr>
<tr>
<td>Jason Chu</td>
<td>The Airline Devaluation Act Revisited: Effects on Returns and Risk in the United States Airline Industry</td>
</tr>
</tbody>
</table>
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.

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.

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.

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.

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.
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 will have a solid understanding of the fundamen-tal 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 and portfolios. 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 career assistance to students, including help with internships and job placement, through its own staff. 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. The program will additionally accept very qualified and motivated part-time students, who will be allowed up to eight semesters to complete the program requirements, subject to annual review of the student’s progress.

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, 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.

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.
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).

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++.

**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:

**Fall Semester**

- ECO 317: Financial Investments
- FIN 501/ORF 514: Asset Pricing I: Pricing Models and Derivatives
- ORF 505/FIN 505: Regression and Applied Time Series

**Spring Semester**

- FIN 502: Corporate Finance and Financial Accounting
- ORF 515/FIN 503: Asset Pricing II: Stochastic Calculus and Advanced Derivatives
- ORF 504/FIN 504: Financial Econometrics

**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 558: Topics in Corporate Finance, Corporate Governance and Banking
- FIN 557: Venture Capital and Private Equity Investment
- FIN 558: 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 420: 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/ECON 335: Introduction to Financial Engineering
- ORF 527: Stochastic Calculus and Finance
- ORF 539: Statistical Analysis of Large Financial Datasets
- ORF 531/FIN 531: Computational Finance in C++
- ORF 534/FIN 534: Financial Engineering
- ORF 555: Fixed Income Models
- ORF 557: Special Topics in Investment Science

**List 2: General Methodology for Finance**

- APC 350: Methods in Partial Differential Equations
- APC 505: Analytical Techniques in Differential Equations
- APC 518: ORF 518: Applied Stochastic Analysis and Methods
- ECO 548: Risk Assessment and Management
- 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 456: Human-computer Interface Technology
- COS 444/ECON 444: Electronic Auctions
- COS 461: Distributed Computing
- ECO 411: Strategy and Information
- ECO 501: Microeconomic Theory I
- ECO 502: Microeconomic Theory II
- ECO 503: Macroeconomic Theory I
- ECO 504: Macroeconomic Theory II
- ECO 511: Advanced Economic Theory I
- ECO 512: Advanced Economic Theory II
- ECO 513: Advanced Econometrics: Time Series Models
- ECO 517: Econometric Theory I
- ECO 518: Econometric Theory II
- ECO 519: Topics in Econometrics
- ECO 521: Advanced Macroeconomic Theory I
- ECO 522: Advanced Macroeconomic Theory II
- ECO 523: Public Finance I
- ECO 524: Public Finance II
- ECO 551: Economics of Labor
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
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.

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 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 517: VENTURE CAPITAL & PRIVATE EQUITY INVESTING
This course will concern itself with the central issues related to venture capital and private equity investing. Topics to be covered include the following: The contractual arrangements between entrepreneurs and venture capital providers; the structure and governance of investment funds; valuation, pricing and structuring of investment transactions; and the current state of the private equity/venture capital industry (including analysis of trends behind the explosive growth of the pool of capital available for so-called “alternative” investments).

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.

ORF 504 / FIN 504: FINANCIAL ECONOMETRICS
This course covers the econometric methods as applied to finance. Topics include: (i) measurement issues in finance; (ii) the predictability of asset returns; (iii) estimation of multifactor asset pricing models and portfolio problems; (iv) econometric methods for option pricing and models for implied volatilities and risk-neutral
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 525/593: 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.

FIN 526/596: 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 575/575: 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.

ECO 504/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.

ORF 534/FIN 534: FINANCIAL ENGINEERING
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 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 Record
Our program has continued to enjoy excellent success with 100% 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).

ORF 515/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.

ORF 554/FIN 554: 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 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 Record**
Our program has continued to enjoy excellent success with 100% 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).

This year a three-day “boot camp” introductory program was developed for the incoming students prior to the beginning of classes in September. The camp focused 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. As a result, we will be repeating the experiment in September 2004, with the “boot camp” likely to become a permanent fixture of the MFin program.

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 2004 graduates, all of whom found permanent employment in top financial institutions at least six months before their graduation, as follows:

Two graduates each at:
- **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
and one graduate each at:

- 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

We have three first year students, all of whom have summer internships as follows:

- BlackRock: Quantitative asset management in New York
- Goldman Sachs: Risk management in New York
- Merrill Lynch: Derivatives trading in Hong Kong

The previous year, 2003, our graduates all found permanent employment as follows:

- Goldman Sachs: 4 graduates
  - Equity research in Hong Kong
  - Derivatives trading in London
  - Options trading in Chicago
  - Private Client Strategy in New York
- Hedge Funds: 3 graduates
  - Citadel in Chicago
  - Start up in London
  - Start up in New York
- Ph.D. Programs: 3 graduates
  - Princeton University
  - Northwestern University
  - London Business School
- Citicorp: 2 graduates
  - Currency trading in New York
  - Fixed income analysis in New York

and one graduate each at:

- Bank of Italy: Banking supervision in Milan
- Derivatech: Software for derivatives pricing in New York
- Gleacher & Co.: Mergers and acquisitions in New York
- JP Morgan Chase: Equity derivatives trading in New York
- Lehman Brothers: Fixed income analytics MBS/ABS in New York
- Merrill Lynch: Capital markets analytical associate in New York
- Morgan Stanley: Emerging markets securities trading in New York
- NY Federal Reserve: Banking supervision in New York
- Putnam Investments: Quantitative asset management analysis in Boston
- Sanford Bernstein: Quantitative asset management strategist in New York

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 2004, the meeting took place on May 13.

MR. GERHARD R. ANDLINGER
Chairman of the Board
Andlinger & Company, Inc.

MR. JOHN C. BOGLE
President
Bogle Financial Markets Research Center, The Vanguard Group

MR. JOHN L. CECIL
Managing Director and Chief Financial and Administrative Officer
Lehman Brothers

MR. CHRISTOPHER A. COLE
Managing Director
Goldman Sachs & Co.

MR. E. ROBERT COTTER, III
Managing Director
Deutsche Bank

MR. HOWARD E. CON, JR.
General Partner
Greylock Management Corporation

MR. DAVID A. DRUNZIO
Managing Director
Crédit Suisse First Boston, LLC

MR. J. MICHAEL EVANS
Partner and Managing Director
Goldman Sachs & Co.

MR. BENJAMIN GREENWOLD
Senior Chairman
BT Alex Brown, Inc.

MR. WILLIAM R. HAMBRECHT
Chairman
W R. Hammbrecht & Co., LLC

MR. JOHN K. HEPBURN
Vice Chairman
Morgan Stanley Group (Europe), P.L.C.

MR. WILLIAM H. HEYMAN
Executive Vice President & Chief Investment Officer
The St. Paul Companies

MR. JOHN A. MAYER, JR.
Chief Financial Officer (Retired)
J.P. Morgan & Company

MR. MICHAEL McCAFFERY
President and Chief Executive Officer
Goldman Sachs & Co.

MR. HEIDI G. MILLER
Executive Vice President & Chief Financial Officer
Bank One

MR. SHARMIN MONSAR-RAHMANI
Managing Director
Goldman Sachs & Co.

MR. JEFFREY M. PEEK
President and Chief Executive Officer
CIT Group, Inc.

MR. LYNTH THOMAN
Managing Partner
Corporate Perspectives

MR. JOHN S. WEINBERG
Managing Director
Goldman Sachs & Co.

MR. PAUL M. WYTHE
Founding General Partner
Sutter Hill Ventures
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.

### Levels and Benefits

**ASSOCIATE PARTNER: $25,000/YEAR**
- Access to BCF faculty for internal or client presentations or for sponsored research
- Access to all research authored by the Center’s affiliated faculty within the academic year
- Invitation and two reserved seats for all Center for Economic Policy Studies symposia and special events
- Invitation to deliver a guest lecture on campus or to participate as a presenter at BCF sponsored conferences
- 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
- Recognition in the publicly disseminated materials of the BCF including the Center’s reports and web site
- Opportunity to use the BCF facilities to host recruiting events
- Access to the BCF Director of Corporate Relations as a resource for recruiting
- Opportunity to advertise internships and employment opportunities to both Undergraduate Certificate in Finance (254 in 2003-04) and Master in Finance students (13 in 2003-04)

**PARTNER: $50,000/YEAR**
- All of the previous benefits, plus:
- 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
- Invitation and two reserved seats for all Center for Economic Policy Studies symposia and special events
- The day-long symposia brings to campus key leaders from business, government and academia. Recent events included:
  - October 17-18, 2003 CEPS Symposium: “Troubled Industries: What Role for Government?” Experts shared their views on the economic outlook and the role for government intervention in the telecommunications, airlines, and steel industries. The keynote address was delivered by Lawrence Lindsey, President of the Lindsey Group, Assistant to the President for Economic Policy during the George W. Bush administration, and a former Governor of the Federal Reserve.
  - November 14, 2003 CEPS dinner: Senator Paul S. Sarbanes shared his insights on the thinking behind the Sarbanes-Oxley Act of 2002, following the presentation, Launny Steffens (Managing Director of the New York hedge fund, Spring Mountain Capital, and former Vice Chairman of Merrill Lynch) and Alan Blinder (Princeton University) discussed the responsibilities of directors of publicly traded companies and issues of executive compensation.
  - February 6, 2004 CEPS dinner: John Reed spoke about his experience as interim chairman and chief executive officer of the NYSE.
  - March 25-27, 2004 Symposium: “The Economic Policies of the Bush Administration.” The keynote address was delivered by Paul R. Krugman (New York Times columnist and Princeton University Professor of Economics and International Affairs). The Economic Outlook was given by Robert B. Dederick (RGC Economics). Health care issues were discussed by Stuart M. Butler (The Heritage Foundation), David Cutler (Harvard University), and Gail Wilensky (Project HOPE). The taxes session was handled by Kevin Hassett (American Enterprise Institute), Harvey Rosen (Council of Economic Advisers), and Joel Slemrod (University of Michigan Business School).

**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.

<table>
<thead>
<tr>
<th>Physical Space</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terrace</td>
<td>$250,000</td>
</tr>
<tr>
<td>Director’s Office</td>
<td>$100,000</td>
</tr>
<tr>
<td>Graduate Student Suite</td>
<td>$100,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Academic Personnel</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Senior Professorships (5 committed, 2 additional needed)</td>
<td>$3,000,000</td>
</tr>
<tr>
<td>Senior Visiting Professorship (1 needed)</td>
<td>$1,500,000</td>
</tr>
<tr>
<td>Postdoctoral Fellows (1 needed)</td>
<td>$1,000,000</td>
</tr>
<tr>
<td>Junior Faculty Fellow (1 committed, 1 additional needed)</td>
<td>$1,000,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fellowships</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graduate Fellowships (3 committed, 7 additional needed)</td>
<td>$250,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Support of Financial Research and Teaching</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research and Course Development Funds</td>
<td>$2,500,000</td>
</tr>
</tbody>
</table>
ACkNOWLEDGMENTS

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 ‘29
J. Michael Evans ‘80
Edward B. Goodnow ‘47
Mr. and Mrs. Randall A. Hack ‘69
John K. Hepburn ‘72
Robert R. Hermann, Jr. ‘75
Mrs. Stanley G. Ivins W34

Oliver M. Langenberg ‘35
Susan Payne Madole ‘76
Edward E. Matthews ‘53
John Mayer ‘62
Reuben M. Morriss, III ‘58
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
Evan A. Wyly ‘84
Mr. And Mrs. Paul M. Wythes ‘55
William T. Young, Jr. ‘70

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