CONTENTS

4  DIRECTOR’S INTRODUCTION

11  FACULTY AND STAFF
    Faculty
    Visiting Faculty Visiting Fellows Staff

39  PH.D. STUDENTS

42  SEMINARS AND CONFERENCES
    Civitas Foundation Finance Seminars
    Finance Ph.D. Student Workshops
    Princeton Initiative: Macro, Money and Finance
    Seventh Cambridge-Princeton Exchange Workshop
    The Princeton Lectures in Finance
    First Measuring Risk Conference
    Humboldt-Princeton Conference
    Second Princeton Quant Trading Conference
    Inaugural Conference of the Julis-Rabinowitz Center
    EDHEC-PRINCETON Institutional Money Management Conference
    Seventh Oxford-Princeton Conference

51  CERTIFICATE IN FINANCE
    Departmental Prizes, Honors, and Athletic Awards to UCF 2012 Students
    Senior Theses and Independent Projects of the Class of 2012

59  MASTER IN FINANCE
    Admission Requirements
    Statistics on the Admission Process
    Program Requirements
    Tracks
    Select Course Descriptions
    Master in Finance Placement
    MFin Math Camp/Boot Camp

73  ADVISORY COUNCIL AND SUPPORTERS
    Advisory Council
    Corporate Affiliates Program
    Gift Opportunities
    Acknowledgments 2011–2012
YACINE AÏT-SAHALIA

Director’s Introduction
Twelve years ago, we opened the doors of the old Dial Lodge to the Bendheim Center for Finance to fulfill the same mission we have today: to develop new courses and programs in finance that will afford exciting learning opportunities to Princeton students, and to establish a leading center for research in modern finance.

Between banking and sovereign debt crises, this continues to be one of the most exciting times for research and teaching in finance. Princeton’s existing finance curriculum has been expanded and improved with the introduction of the Undergraduate Certificate in Finance in 1999 and Master in Finance in 2001. Recently we have added courses on the rise of the Asian financial markets, history of financial crises, and regulation of international financial markets, to name a few.

Center-affiliated faculty members continue to 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 Bendheim Center for Finance has been an ideal environment in which to conduct significant research in finance. It also has served 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 continues to provide an additional source of intellectual stimulation and interchange for the Bendheim Center for Finance, and in recent years we have seen outreach and partnership with firms and alumni as far-flung as London, Hong Kong, Shanghai, and beyond. Our students are able to explore both internships and permanent job opportunities in an increasingly wide variety of finance-related areas, which have expanded from a few large Wall Street investment banks at the inception of the program to jobs in firms of all sizes and types around the world. The Bendheim Center for Finance also encourages students at all levels to conduct finance-related research at the University by providing such services as funding senior thesis projects, acting as a clearinghouse and major source of data, and providing expert faculty advisers for both undergraduate and master’s research projects.

The scholars in the Bendheim Center for Finance are chosen for their ability to deploy cutting-edge methodologies to a wide range of finance-related topics, from stock-price determination and 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, computer science, psychology, and public policy 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 Bendheim Center for Finance.
The past 12 years have proven finance’s importance to Princeton’s continued success as an educational and research institution, given 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 has never been 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 the University 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 Bendheim Center for Finance.

By helping to attract outstanding new faculty, encouraging and supporting the work of existing faculty, and bringing outstanding scholars and practitioners from private industry to campus, the center continues to stimulate exciting new research, dialogue, and collaboration. And through its educational programs, the center will continue to enhance the education, training, and career opportunities of many of the world’s best students for decades to come.

**2011-2012 DEVELOPMENTS**

Christopher Sims won the 2011 Nobel Prize with Thomas Sargent of NYU for their research on cause and effect in macroeconomics. Sims is the third BCF-affiliated faculty member to win the Nobel Prize in Economic Science since the BCF’s founding, after Danny Kahneman (2002) and Paul Krugman (2008).

In 2011, investment executive Mitch Julis, a member of Princeton’s class of 1977, made a substantial gift to create the Julis-Rabinowitz Center for Public Policy and Finance. The center’s first conference took place in April 2012 and was attended by more than 200 faculty, alumni, corporate affiliates and guests. (More information about the program is included in the Conferences and Events section of this report).

Two new faculty members joined the center in 2012—Atif Mian and Valentin Hadad. Mian joins as Professor of economics and public affairs from the University of California-Berkeley, where he has been a faculty member since 2009. He previously taught at the University of Chicago. Mian’s research focuses on links between financial markets and the macroeconomy. His work emphasizes the role played by political, governance and organizational constraints in shaping the effectiveness and scope of financial markets. He has published widely on topics such as the origins of the global financial crisis, the political economy of government intervention in financial markets, and the link between asset prices, household borrowing and consumption. Mian holds bachelor’s and master’s degrees from the Massachusetts Institute of Technology.
Mian will be teaching a new course—WWS 594—Financial Regulation, Crises and Macro Policy—which will focus on the origins and consequences of financial crises, addressing such fundamental questions as whether financial markets are efficient or susceptible to bubbles, the difference between bank liquidity and bank solvency, the relationship between financial regulation and bank CEO incentives, capital arbitrage, securitization and credit rating agencies, debt-overhang and how it impacts employment, GDP and inflation, the roles and limits of fiscal and monetary policy in a financial crisis, and how politics shapes and distorts policy.

Haddad received his Ph.D. in Economics and Finance from the University of Chicago Booth School of Business and Department of Economics and has a bachelor’s and master’s degree in applied mathematics and economics from Ecole Polytechnique. His research interests include asset pricing and macroeconomics with financial frictions.

MFin Alumnus Dario Villani, portfolio manager with BlueCrest Capital Management, will return to campus in the spring of 2013 to teach ORF574/FIN574, “Special Topics in Investment Science: Trading and Risk Management.”

PH.D. STUDENTS
Ten students with finance interests received their Ph.D. in 2012 and accepted the following positions:

- JOSÉ AZAR, Charles River, senior associate
- DONG BEOM CHOI, New York Federal Reserve, economist
- HYUN SOO CHOI, Singapore Management University, assistant professor
- WEIJIE GU, Barclays Capital, associate
- ANDREW ROBINSON, BlackRock Scientific, associate
- MARTIN SCHMALZ, University of Michigan, Ross School of Business, assistant professor
- WARREN SCOTT, Lawrence Livermore National Laboratory, post doc research
- XIN TONG, MIT, assistant professor, department of mathematics
- MING YANG, Duke University, Fuqua School of Business, assistant professor
- SERGEY ZHUK, University of Vienna, assistant professor
MASTER IN FINANCE

The 10th class of the Center’s Master in Finance (MFin) program graduated in June with 21 students. Years of investment in the placement of our graduating students continued to pay off in what remained a difficult job market, especially since our MFin students tend to all seek jobs with financial firms and have little desire to branch out outside that industry. The networking efforts of our Director of Corporate Relations, the strong support from our Corporate Affiliates and our Advisory Council, and the success enjoyed by our previous graduating classes have been reflected once again in 100 percent placement of our first-year students in summer internships and 95 percent of our graduating students in permanent positions. While costly in the short run in terms of faculty and staff involvement, in the long run, a successful placement record is critical to maintain the program’s leading position which was recognized in industry surveys.

The number of MFin applications for 2012-13 was up significantly from 729 in January 2011 to 815 in January 2012, an all-time high. We continued to conduct interviews of the most promising subset of our applicant pool, a process that helps us ascertain which of the strong academic candidates we had identified through their written applications also excelled in areas such as communication and leadership. This year, we interviewed 169 of the applicants and made 48 offers of admission (compared to 36 last year). Our selectivity rate continues to be extremely high, with our program admitting about 5.9 percent of its applicant pool. This is a much smaller percentage than our peer programs in quantitative finance (Carnegie Mellon University, Columbia University, Massachusetts Institute of Technology, New York University, Stanford University, University of California–Berkeley, University of Chicago, etc.), which typically admit around 25 percent of their applicant pool.

We received 43 acceptances (compared to 29 last year). Our yield (89.6 percent this year, significantly higher than last year’s 80.5%) remained remarkably high, despite the absence in most cases of financial aid, which was limited to a total of two half-semester and five quarter-semester fellowships among the 43 students.

A strong applicant pool and yield reflect the recognition that the program is gaining in the wider quantitative finance community and among the top undergraduate institutions that are providing us with applicants. We have continued to rely on our Advisory Council to help us recruit the most promising applicants: we ask our members to speak or meet with the admitted students in order to tell them about Princeton and help steer them in our direction. Not surprisingly, our Advisory Council members tend to be excellent at selling and many report that they enjoy the opportunity to feel connected in this way to the program. We also get a positive “halo” effect with the admitted students, who are uniformly impressed with the fact that industry leaders stand behind the program.
UNDERGRADUATE CERTIFICATE IN FINANCE

Now in its 15th year, the Undergraduate Certificate in Finance (UCF) continues to do extremely well. We currently have 104 students in the Class of 2013 and will enroll 100 juniors from the Class of 2014. This will bring our total number of undergraduate students in the program (juniors and seniors) to 204 for the coming academic year, despite our grade-based cap in place. UCF students are drawn to the program from a wide variety of departments. Only about half of our students come from Economics and ORFE combined; the other half come this year from the following 17 departments, in decreasing order of numbers of students in the UCF: Mathematics, Woodrow Wilson School, Computer Science, Chemical and Biological Engineering, Physics, Electrical Engineering, Mechanical and Aerospace Engineering, Chemistry, Philosophy, Psychology, Molecular Biology, Near Eastern Studies, Architecture, Astrophysical Sciences, Classics, Comparative Literature, and Politics.

Not surprisingly given the demands of a multidisciplinary program in addition to those of their major, UCF students continue to be high achievers among the Princeton population and receive a high proportion of the prizes awarded by their respective departments. This year, UCF seniors received 11 departmental prizes (two receiving two prizes) and four UCF juniors received three departmental prizes; 15 UCF students were elected to Phi Beta Kappa Society; 22 UCF students were elected to membership in Society of Sigma Xi; 13 UCF students were elected to membership in Tau Beta Pi National Engineering Society; one senior (the only one in the Class of 2012) received the Shapiro Prize for Academic Excellence, while 3 UCF juniors received the Shapiro Prize for Academic Excellence, 2010-2011; and 45 UCF students received academic honors (11 cum laude, 16 magna cum laude, and 18 summa cum laude). 32 of our UCF students earned certificates in proficiency from 13 other departments or programs, 20 students earning 1 additional certificate, 11 earning 2 additional certificates and 1 earning 3 additional certificates.

FUNDRAISING AND ADVISORY COUNCIL

As in past years, 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 competitive market, we have found it necessary to make commitments to provide research support for faculty members. All of this requires active fundraising, and we continue to work closely with the Office of Development to increase the Center’s resources. This year we give special thanks to David H. Blair ’67, Howard E. Cox, Jr. ’64, Robert R. Hermann, Jr. ’75, Kenneth A. Hersh ’85, William H. Heyman ’70, William H. Janeway ’65, and Jonathan F. Schachter, Ph.D. ’94 for their generous gifts to the center.

Looking back, similar gifts from generous alumni have established conferences and symposia, enabled ongoing faculty development, provided scholarships to deserving young students, and refurbished physical spaces important for interaction both inside and outside the classroom.
As we had anticipated during the flush years, our Corporate Affiliates Program has slowed down due to the economic environment and the continued budgetary challenges facing the industry. Recognizing the effect of the economic environment, we have focused on maintaining and developing long-term relationships, as well as recruiting partnerships with a broader group of firms. We are pleased to welcome two new corporate affiliates to the program—AXA Equitable and Edelman & Associates. In addition, the following firms have remained active in recruiting efforts and have expressed a continued interest in our program: Barclays Capital, Citadel Investments Group, Citigroup, Crédit Suisse, DC Energy, Deutsche Bank, Goldman Sachs, and UBS/Prediction Company.

Over the past 13 years, the Center has relied on the help and advice of prominent alumni working in the financial sector. The tenth annual meeting of the Advisory Council took place on campus on May 3-4, 2012. We are grateful for their leadership, involvement and counsel.

Yacine Aït-Sahalia
Otto A. Hack ’03 Professor of Finance and Economics
Director, Bendheim Center for Finance, June 2012
2011–12
FACULTY AND STAFF
FACULTY

DILIP ABREU is the Edward E. Matthews, Class of 1953, Professor of Finance and 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 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 the University of Oxford, and a Ph.D. in economics from Princeton.

COURSES TAUGHT
- ECO 200: Advanced Principles of Economics
- ECO 418: Strategy and Information

GRADUATE STUDENTS ADVISED
- Benjamin Brook

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. He was previously a professor at the University of Chicago’s Graduate School of Business. He was named an outstanding faculty member by *BusinessWeek’s 1997 Guide to the Best Business Schools* and is the recipient of the 1997 Michael Brennan Award, the 2001 FAME Award, and the 2003 Aigner Award. He received fellowships from the Sloan and Guggenheim Foundations. He is a fellow of the Econometric Society, the American Statistical Association, and the Institute of Mathematical Statistics, and a research associate for the National Bureau of Economic Research. He currently serves as a co-editor of the Journal of Econometrics. He edited the Handbook of Financial Econometrics with Lars P. Hansen. He received his Ph.D. in economics from the Massachusetts Institute of Technology in 1993 and his undergraduate degree from France’s École Polytechnique.

COURSES TAUGHT
- ECO 462/FIN 515: Portfolio Theory and Asset Management
- ECO525/FIN 595: Asset Pricing I

GRADUATE STUDENTS ADVISED
- Jia Li, “Testing for Jumps: A Delta-Hedging Perspective”
- Dacheng Xiu, “Essays on the Econometrics of High Frequency Data”

REPRESENTATIVE PUBLICATIONS

ALAN BLINDER is the Gordon S. Rentschler Memorial Professor of Economics. He also founded the Griswold Center for Economic Policy Studies at Princeton in 1990. He is former vice chairman of the Board of Governors of the Federal Reserve System (1994–96) and before that was a member of President Clinton’s original Council of Economic Advisers (1993–94). He also served briefly as deputy assistant director of the Congressional Budget Office in 1975. He is the vice chairman of Promontory Interfinancial Network, a director of the Council on Foreign Relations, and a member of the Economic Club of New York. Blinder was elected to the American Philosophical Society and the American Academy of Arts and Sciences. He is the author or coauthor of 17 books and has written scores of scholarly articles on topics such as fiscal policy, monetary policy, and the distribution of income. He received his Ph.D. from the Massachusetts Institute of Technology.

COURSES TAUGHT
• ECO 101: Introduction to Macroeconomics
• WWS 524: Domestic Macroeconomics: The Political Economy of Central Banking

GRADUATE STUDENTS ADVISED
• Andrew Tifin, “Essays in International Finance: Institutions, Capital Flow and Growth”

REPRESENTATIVE PUBLICATIONS

**MARKUS BRUNNERMEIER** is the Edwards S. Sanford Professor at Princeton University. He is a faculty member of the Department of Economics and affiliated with Princeton’s Bendheim Center for Finance and the International Economics Section. He is the director of Princeton’s Julis Rabinowitz Center for Public Policy and Finance. He is also a research associate at CEPR, NBER, and CESifo, and a visiting scholar at the Federal Reserve Bank of New York. He was awarded his PhD. by the London School of Economics (LSE), where he was also affiliated with its Financial Markets Group. His research focuses on financial markets and the macroeconomy with special emphasis on bubbles, liquidity, financial stability and its implication for financial regulation and monetary policy. His models incorporate frictions as well as behavioral elements. He is a Sloan Research Fellow, Fellow of the Econometric Society and the recipient of the Bernácer Prize granted for outstanding contributions in the fields of macroeconomics and finance. He recently received a Guggenheim Fellowship for studying the impact of financial frictions on the macroeconomy. He is also an associate editor of the American Economic Review, Journal of European Economic Association, Journal of Finance and was previously on the editorial board of the Review of Financial Studies and the Journal of Financial Intermediation.

**GRADUATE STUDENTS ADVISED**
- Dong Choi, “Heterogeneity and Stability: Bolster the Strong Not the Weak”
- Martin Schmalz, “Managing Human Capital Risk”

**REPRESENTATIVE PUBLICATIONS**
- “Deciphering the 2007-08 Liquidity and Credit Crunch,” *Journal of Economic Perspectives* 23 (1).

**RENÉ CARMONA** is the Paul M. Wythes ’55 Professor of Engineering and Finance. As director of graduate studies of the Bendheim Center for Finance, he is responsible for the Master in Finance program. He joined Princeton in 1995. He was granted the “Aggregation” of mathematics (federal degree) in 1969, and a “These d’Etat” in probability from the University of Marseille in 1977. He was elected fellow of the Institute of Mathematical Statistics in 1984, and of the Society for Industrial and Applied Mathematics (SIAM) in 2009. He is also a member of the Bachelier Finance Society. Among his many editorial responsibilities, he was the co-founder and editor in chief of Electronic Journal in Probability, Communications in Probability and SIAM Journal on Financial Mathematics. He works on mathematical models for the commodity markets, especially the energy and emissions markets, and computational methods for quantitative finance.
COURSES TAUGHT
- ORF 405: Regression & Applied Time Series
- ORF 542: Stochastic Control and Stochastic Differential Games
- ORF 557, 558: Stochastic Analysis Seminar

UNDERGRADUATE STUDENTS ADVISED
- Kyle O’Donovan “The New Asian Option: Using Temperature and Rainfall to Predict and Hedge the Uncertainty in Chinese Tea Harvests”
- Patrick Ohlendorf, “Reconsidering Public University Debt Management in Light of the 2008 Financial Crisis: A Stochastic Optimization Approach”
- Christian Villaran, “Maintenance Scheduling for Caracas: Maintaining Power Plants in a Failing Grid”

GRADUATE STUDENTS ADVISED
- Zhou Yang, “A Study on Differential Games with Applications to Asset Management and Market-Liquidity Research”
- Youhong Sun, “Spread Options and Implied and Local Correlations”
- Yi Ma, “Arbitrage Free Monte Carlo Simulation of Implied Volatility Surface Evolutions”

REPRESENTATIVE PUBLICATIONS
- “Optimal Stochastic Control and Carbon Price Formation” (with M. Fehr & J. Hinz)
- “Market Design for Emissions Markets Trading Schemes” (with M. Fehr, J. Hinz & A. Porchet)
- “The Clean Development Mechanism and CER Price Formation in the Carbon Emissions Markets” (with M. Fehr)
- “Tangent Levy Market Models” (with S. Nadtochyi)
- “Tangent Models as a Mathematical Framework for Dynamic Calibration” (with S. Nadtochyi)

PATRICK CHERIDITO is an associate professor of operations research and financial engineering. His research interests lie in probability theory and its applications to finance and insurance. Recently, he has been working on stochastic models for interest rates, dynamic risk measurement, risk allocation problems and backward stochastic differential equations.

COURSES TAUGHT
- ORF 526: Probability Theory
- ORF 570: Convex Analysis
UNDERGRADUATE STUDENTS ADVISED
- Phillips M. Cao, “Bid and Ask Prices in Options Markets with Transaction Costs”
- Daniel Xiochen Wang, “Analytical Approaches to Calculating Value-at-Risk of a Quadratic Approximation of a Stock and Options Portfolio”
- Ray Wang, “Modeling Systemic Risk Using Networks”

GRADUATE STUDENTS ADVISED
- Alexander Wugalter, “Pricing and Hedging in Affine Models with Possibility of Default and Characteristic Functions of Log Stock Prices”
- Jared Klyman, “Systemic Risk Measures: Dist VaR and Other Too-Big-To-Fail Risk Measures”

RECENT PUBLICATIONS
- “Optimal Consumption and Investment in Incomplete Markets with General Constraints,” Stochastics and Dynamics 11(2),2011, p. 283-299 (with Y. Hu)

GREGORY CHOW is a professor of economics, emeritus, and the Class of 1913 Professor of Political Economy, Emeritus. He was manager of economic research at the I.B.M. Thomas J. Watson Research Center from 1962–70, and director of the Econometric Research Program at Princeton from 1970–97. The program was renamed the Gregory C. Chow Econometric Research Program in 2001. Chow is a member of the American Philosophical Society and of Academia Sinica and a fellow of the American Statistical Association and of the Econometric Society. He has served as associate editor or co-editor of the American Economic Review, China Economic Review, International Economic Review, Journal of Economic Dynamics and Control, MOCT-MOST, and the Review of Economics and Statistics. Chow’s contributions to economics cover three main areas: econometrics, including the often used “Chow test” for parameter stability, the estimation of simultaneous stochastic equations, and criteria for model selection; dynamic economics, including spectral methods and optimal control methods for the analysis of econometric models and dynamic optimization under uncertainty to be solved by the method of Lagrange multipliers (in lieu of dynamic programming); and the Chinese economy, an institutional, theoretical, and quantitative approach to its study. He received his Ph.D. from the University of Chicago. He writes a column in three major newspapers in China and one in Taiwan. He is editor of the Routledge Handbook of the Chinese Economy and independent director of the Taiwan Semiconductors Manufacturing Company.
ERHAN ÇINLAR is the Norman J. Sollenberger Professor of Engineering in the Department of Operations Research and Financial Engineering. He came to Princeton as a visiting professor of statistics in 1979–80. He is a fellow of the Institute of Mathematical Statistics, a fellow of INFORMS, an elected member of the International Statistical Institute, and the recipient of the Science Prize of TUBITAK. He has served as editor or associate editor of more than 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. He received the President’s Award for Distinguished Teaching during the June 2010 Princeton Commencement ceremonies. He received the Lifetime Achievement Award for Excellence in Teaching for the Engineering School Student Council in 2011.

COURSES TAUGHT
• ORF 309: Probability and Stochastic Systems
• ORF 551/APC 521: Probability Theory

UNDERGRADUATE STUDENTS ADVISED
• Matthew Connor, “Option Pricing and Momentum and Mean Reversion”
• Graham MacDonald, “Markov Chain and Random Walk Analysis of Professional Squash Players”

REPRESENTATIVE PUBLICATIONS

JIANQING FAN is the Frederick L. Moore ’18 Professor of Finance, and he joined the Department of Operations Research and Financial Engineering in 2003. His research interests are financial econometrics, asset pricing, risk management, nonlinear time series, high-dimensional data analyses, nonparametric modeling, and computational biology. As a specialist in statistics and financial econometrics, Fan received the 2000 Presidents’ Award from the Committee of Presidents of Statistical Societies, recognizing the most outstanding statistician under age 40; the 2007 Morningside Gold Medal of Applied Mathematics, given triennially to an outstanding applied mathematical scientist of Chinese descent under age 45; and the Guggenheim Fellowship in 2009. He was the president of the Institute of Mathematical Statistics, an international professional and scholarly society. He is an elected fellow of the American Association for the Advancement of Science, the American Statistical Association, and the Institute of Mathematical Statistics. He has coauthored two highly regarded books. He delivered a talk at the 2006 Madrid International Congress for Mathematicians, a high honor in mathematical sciences. He serves as the co-editor of the Journal of Econometrics, and Econometrics Journal and an associate editor of Econometrica, Journal of the American Statistical Association and Journal of Financial Econometrics. He has served as the co-editor (in-chief) of the Annals of Statistics (2004–06), and an editor of the Journal of Multivariate Analysis (1998–2000) and Probability Theory and Related Fields (2003–05). He earned his Ph.D. from the University of California–Berkeley. He served as the director of graduate studies of both Ph.D. program of ORFE and Master in Finance in BCF.

COURSES TAUGHT
• ORF 504/FIN 504: Financial Econometrics
• ORF 565: Empirical Process and Asymptotic Theory

UNDERGRADUATE STUDENTS ADVISED
• Natalie H. Shoup, “Sustainable Energy Economics: Optimizing the Integration of Renewables in Guatemala”
• Jonathan H. Wang, “Explaining Credit Default Swap Premia: Analyzing the Relationship between Global CDS Spreads and Stochastically Modeled Corporate Default Probabilities”
• Yiran Lillian Ma, “Sensitivity Analysis on a Transitive-State Markov Model of Diabetes”
• Edgar Dobriban, “Regularity Properties of Random Matrices and Applications”

GRADUATE STUDENTS ADVISED
• Jelena Bradic, “Sparse Estimation and Oracle Properties of Regularized Regression with Non-Polynomial Dimensional Covariates”
• Lei Qi, “Essays on the Estimation of Time Series Models”
• Weijie Gu, “Estimating False Discovery Proportion under Covariance Dependence”
• Xin Tong, “Learning with Asymmetry, High Dimension, and Social Networks”
POSTDOCTORAL FELLOWS SUPERVISED
• Yuan Liao, “Financial Econometrics”
• Michael Imerman, “Finance”
• Runlong Tang, “High-dimensional Statistical Learning and Inference”
• Yunbei Ma, “High-dimensional Statistical Learning and Inference”

REPRESENTATIVE RECENT PUBLICATIONS

MIKHAIL GOLOSOV Mikhail Golosov is a professor of economics at Princeton University. Dr. Golosov has also held positions at Yale University and the Massachusetts Institute of Technology. He is the associate editor of Econometrica and Journal of Public Economics. Dr. Golosov was awarded the Sloan Research Fellowship in 2008 as well as the National Science Foundation CAREER Grant. His research covers topics in macro economics, public finance and political economy.

HARRISON HONG is the John Scully ’66 Professor of Economics and Finance. He teaches courses in finance in the undergraduate, master’s, and Ph.D. programs. Before joining Princeton in 2002, he was on the faculty of the Graduate School of Business at Stanford University, most recently as an associate professor of finance. He received his B.A. in economics and statistics with highest distinction from the University of California- Berkeley in 1992 and his Ph.D. in economics from the Massachusetts Institute of Technology in 1997. His research has covered such topics as: behavioral finance and stock market efficiency; asset pricing and trading under market imperfections; social interaction and investor behavior; security analyst incentives and forecast biases; organizational form and mutual fund performance; and destabilizing arbitrage, socially responsible investing, and commodities pricing. His work has received numerous awards and grants. He is on the editorial boards of the Journal of Finance and the Journal of International Central Banking. He was awarded the 2009 Fischer Black Prize by the American Finance Association, given bi-annually to the best financial economist under the age of 40.
COURSES TAUGHT:
• ECO 362  Financial Investments
• ECO 468/FIN 568 – Behavioral Finance and Economics

GRADUATE STUDENT ADVISED:
• Hyun Soo Choi, “Three Essays on Real Estate Finance”

REPRESENTATIVE PUBLICATIONS

HAROLD JAMES, who holds a joint appointment as a professor of international affairs in the Woodrow Wilson School and a professor in the history department, studies economic and financial history and modern German history. He was educated at the University of Cambridge (Ph.D., 1982) and was a fellow of Peterhouse for eight years before coming to Princeton in 1986. In 2004, he was awarded the Helmut Schmidt Prize for Economic History, and in 2005, the Ludwig Erhard Prize for writing about economics. He is chair of the editorial board of World Politics.

COURSES TAUGHT
• WWS 340/HIS 466: The History of Financial Crises
• HIS 366: Germany Since 1806
• HIS 554: Germany in 19th and 20th Centuries

REPRESENTATIVE PUBLICATIONS

JAKUB JUREK is an Assistant Professor at the Department of Economics at Princeton University, and a research fellow at the National Bureau of Economic Research. He joined the Bendheim Center for Finance in 2008, and teaches courses on fixed income and financial economics. His research focuses on theoretical and empirical asset
pricing, with applications to liquidity, credit risk and portfolio management. Jakub’s recent work develops option-based methods for the valuation of collateralized debt obligations (CDOs) and the dynamics of repo market financing terms. His research has been published in refereed journals such as the Journal of Finance, American Economic Review and the Review of Finance. Jakub holds an undergraduate degree in Applied Mathematics and a Ph.D. in Business Economics, both from Harvard University. Prior to entering graduate school, he was an analyst at the quantitative equity strategy groups at Goldman Sachs and AQR Capital Management. He has also served as a consultant to Grantham, Mayo, van Otterloo, LLC, a Boston-based investment management company, and the Harvard Management Company.

COURSES TAUGHT
- ECO 466/FIN 521 Fixed Income: Models and Applications
- ECO 467/FIN 567 Institutional Finance
- ECO 525/FIN 595 Financial Economics I

UNDERGRADUATE STUDENTS ADVISED
- Ahsan Mosharraf Barkatullah, “Credit Rating Agencies and Ratings Inflation”
- Ji Un Han, “A Test of the Expectations Hypothesis of the Term Structure of Sovereign Credit Default Swaps: Is Sovereign Risk Premium Time-Varying?”
- John P. Votta, “Game of Trends: Institutional Ownership, Short Selling, and the Post-Earnings Announcement Drift”
- James Jiajun Luo, “Asset Pricing Implications of Information Asymmetries in Large Investor Networks”
- Sean Pi, “Trade Credit as a Model Risk Factor: Predicting Firm and Supply Chain Linked Company Returns”

REPRESENTATIVE PUBLICATIONS

WORKING PAPERS
- “The Cost of Capital for Alternative Investments,” April 2012 (with E. Stafford)
- “Crashes and Collateralized Lending,” April 2011 (with E. Stafford)

**DANIEL KAHNEMAN** is a senior scholar at the Woodrow Wilson School of Public and International Affairs. He is also professor of psychology and public affairs, emeritus, at the Woodrow Wilson School, the Eugene Higgins Professor of Psychology Emeritus at Princeton, and a fellow of the Center for Rationality at the Hebrew University in Jerusalem. Kahneman has held the position of professor of psychology at the Hebrew University in Jerusalem (1970–78), the University of British Columbia (1978–86), and the University of California–Berkeley (1986–94). He is a member of the National Academy of Science, the Philosophical Society, and the American Academy of Arts and Sciences, and a fellow of the American Psychological Association,
the American Psychological Society, the Society of Experimental Psychologists, and the Econometric Society. He has been the recipient of many awards, among them the Nobel Prize in Economic Sciences (2002); the Lifetime Contribution Award of the American Psychological Association (2007) and the Grawemeyer Prize (2002), both jointly with Amos Tversky; the Warren Medal of the Society of Experimental Psychologists (1995); the Distinguished Scientific Contribution Award of the American Psychological Association (1982); and the Hilgard Award for Career Contributions to General Psychology (1995). Kahneman holds honorary degrees from numerous universities.

REPRESENTATIVE PUBLICATIONS

NOBUHIRO KIYOTAKI is the Harold H. Helm ’20 Professor of Economics and Banking and 2010-11 Visiting Centennial Professor at the London School of Economics and Political Science. He received his Ph.D. at Harvard University. He has published widely in macroeconomics and monetary economics, including “Monopolistic Competition and the Effects of Aggregate Demand,” with Olivier Blanchard in 1987, “On Money as a Medium of Exchange,” with Randall Wright in 1989, and “Credit Cycles,” with John Moore in 1997. Kiyotaki also serves as an academic consultant for the Federal Reserve Bank of New York. Among professional honors, Kiyotaki received in 2010 the Stephen A. Ross Prize in Financial Economics and in 1999 the EEA Yrjo Jahnsson Award together with John Moore. He is a Fellow of the Econometric Society and a Fellow of the British Academy.

COURSE TAUGHT
- ECO 522: Advanced Macroeconomics
- ECO 301: Macroeconomics

GRADUATE STUDENTS ADVISED
- Edouard Schall “Three Essays on Macroeconomics of Labor Market” completed May 2011, now assistant professor at NYU.

PAUL R. KRUGMAN is a professor of economics and international affairs. He is the author or editor of dozens of books and several hundred articles, primarily about international trade and international finance. He is also internationally 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. In 2008, Krugman
received the Nobel Prize in Economic Sciences. He was the recipient of the 1991 John Bates Clark Medal, an award given every two years by the American Economic Association to an economist under 40. He 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 472: Special Topics in Public Affairs – The Economics of the Welfare State

REPRESENTATIVE PUBLICATIONS
- Macroeconomics, 2005 (with R. Wells).
- Principles of Economics, 2004 (with R. Wells).

BURTON MALKIEL has been the Chemical Bank Chairman’s Professor of Economics at Princeton since 1988. He entered emeritus status in 2011. His research interests center on financial markets, asset pricing, and investment strategies. He is a regular op-ed writer for The Wall Street Journal. He also serves on the boards of several financial and non-financial corporations. He has been awarded an Honorary Doctor of Humane Letters from the University of Hartford (1971), Phi Beta Kappa, and the Harvard Business School Alumni Achievement Award for 1984. He has served as the president of the American Finance Association. He received his Ph.D. from Princeton.

COURSES TAUGHT
- ECO 362: Financial Investments

UNDERGRADUATE STUDENTS ADVISED
- Joshua Rosner, “The Build America Bond Programs: An Empirical Analysis of Issuer Borrowing Costs and the Muni-Puzzle”
- Sean (Xueyang) Li, “A New Way to Invest: Style Timing Using Dynamic Rank Weighting”

GRADUATE STUDENT ADVISED
- Nicholas Racculia “Returns from Investing in Venture Capital”

REPRESENTATIVE PUBLICATIONS
**STEPHEN MORRIS** is the Alexander Stewart 1886 Professor of Economics, and his work ranges from game theory to applied (microeconomic) theory to topics in financial economics. He joined Princeton in 2005. He taught at the University of Pennsylvania from 1991 to 1998, first as an assistant and then as an associate professor. He joined the Yale University faculty as a professor of economics in 1998. Morris received his Ph.D. in economics from Yale in 1991.

**COURSES TAUGHT**
- ECO 317: The Economics of Uncertainty
- ECO 502: Microeconomic Theory II
- ECO 512: Advanced Microeconomic Theory II

**UNDERGRADUATE STUDENTS ADVISED**

**GRADUATE STUDENT ADVISED**
- Ming Yang, “Essays in Strategic Information Acquisition
- Takuo Sugaya, “Essays on Repeated Games With Private Monitoring
- Eduardo Grillo, “Essays in Strategic Communication”

**REPRESENTATIVE PUBLICATIONS**

**ULRICH MÜLLER** is an associate professor in the Department of Economics. He received his Ph.D. in economics from the University of St. Gallen, Switzerland. His main research interest is time series econometrics. His recent work focuses on Bayesian inference, low frequency variability, and the development of econometric tools that are robust to correlations of largely unknown form.

(NO undergraduate students this year)

**REPRESENTATIVE PUBLICATIONS**

**JOHN MULVEY** is a professor of operations research and financial engineering. His research interests center on designing financial planning systems, primarily for pension plans, 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 the Towers Perrin-Tillinghast investment system in 1999. He received his Ph.D. in management from the University of California–Los Angeles.

**COURSES TAUGHT**
• ORF 534: Investment Science
• ORF 311: Optimization under Uncertainty

**UNDERGRADUATE STUDENTS ADVISED**
• Ariel Brown, “Counterparty Credit Risk: An Exploration of Hidden Dangers in Exchange Traded Products”
• Harris Perlman, “Imitating Masters: On Replicating the Investment Returns of Fine Art”
• Benjamin Yao, “Replication and Comparison of Commodity Futures Trading Strategies”

**GRADUATE STUDENTS ADVISED**
• Astrid Prajogo, “Analyzing Patterns in the Equity Market Using ETF Investor Sentiment and Corporate Cash Holding”
• Lorenzo Reus, “Discovering Regimes in Currencies Tactics, and Related Issues for Private Equity Investors”
• Mehmet Vural, “Term Structure Characteristics of Commodities, U.S. Dollar Interest Rates, and Multi Regime Portfolio Optimization”

**REPRESENTATIVE PUBLICATIONS**

**BIRGIT RUDLOFF** is an assistant professor of operations research and financial engineering. Her research interests include hedging, price bounds and risk measurement in markets with transaction costs, hedging in incomplete markets with convex risk measures, portfolio optimization with risk constraints, mathematical finance, risk management, and convex analysis. She received her Ph.D. in mathematical finance from Martin-Luther University Halle-Wittenberg (Germany) in 2006 and visited the research institute IMPA in Rio de Janeiro and the technical university in Vienna before coming to Princeton in 2006.

**COURSES TAUGHT**
• ORF 435: Financial Risk Management
• ORF 533: Convex Analysis for Mathematical Finance
• ORF 515: Asset Pricing II: Stochastic Calculus and Advanced Derivatives.

**UNDERGRADUATE STUDENTS ADVISED**
• Selene Sooyeon Kim, “Indifference Pricing under Transaction Costs”
• Jack Wang, “Spread Options under Transaction Costs”

**GRADUATE STUDENTS ADVISED**
• Zach Feinstein, “Set-valued Dynamic Risk Measure for Markets with Transaction Costs”
• Cagin Arat, “The Set-valued Entropic Risk Measure for Markets with Transaction Costs”
• Firdevs Ulus, “An Algorithm to Solve Convex Vector Optimization Problems and Its Application for Utility Maximization for Incomplete Preferences”

**REPRESENTATIVE PUBLICATIONS**
• “Risk Minimization and Set-valued Average Value at Risk Via Linear Vector Optimization,” submitted for publication 2012 (with A. Hamel, M. Yankova).
• “Set-valued Dynamic Risk Measures,” submitted for publication 2012 (with Z. Feinstein)
• An Algorithm for Calculating the Set of Superhedging Portfolios in Markets with Transaction Costs,” submitted for publication 2012 (with A. Loehne).

**YULIY SANNIKOV** is a Professor of economics whose research interests include economic theory, corporate finance and macroeconomics with financial frictions. Yuliy Sannikov got his B.A. from Princeton and a Ph.D. from Stanford GSB. Yuli was an invited panel speaker at several meetings of the Econometric Society, including North

UNDERGRADUATE STUDENTS ADVISED

- Vijay Chetty, “How Yesterday’s Merchants of Venice Led to Today’s Margins and Volatility: An Intermediation-Based Comparative Approach to the Leverage Cycle”
- Ryan Makis, “NFL Scouting Combine: Econometric Analysis Determining Indicators of Success and Evaluating the Market for NFL Prospects”
- Atanas Petkov, “Understanding Catastrophe Bond Pricing: Empirical and Theoretical Approaches”
- Kunal Poddar, “Bank-dependent Versus Bond-issuing Firms: An Analysis of Monetary Tightening in India”
- Shasanka Pradhan, “Effect of Acquirer’ Venture Capital-backing on Their Announcement Period Abnormal Returns”
- Samuel Roeca, “A Paradox of Internal Capital markets: The Effect of Regional and Systematic Stress on Lending in Regionally Diversified U.S. Banks”
- Maxwell Shaw, “The Internet Bubble 2.0: Revisiting Investor Sentiment During the DOT-COM Era Amid Discussion of Today’s Web 2.0 Boom”
- Huijia Wu, “Information Shocks and Bubble Crashes”

REPRESENTATIVE PUBLICATIONS


JOSÉ A. SCHEINKMAN joined Princeton as the Theodore Wells ’29 Professor of Economics in 1999. He received an M.S. in mathematics from the Instituto de Matemática Pura e Aplicada, Brazil, and an M.A. and a Ph.D. in economics from the University of Rochester. Scheinkman is a research associate of the National Bureau of Economic Research, a member of the National Academy of Sciences, a fellow of the American Academy of Arts and Sciences and of the Econometric Society, and a “docteur honoris causa” of the University of Paris-Dauphine. He was named a fellow of the John Simon Guggenheim Memorial Foundation in 2007. From 1973 to 1998,
Scheinkman taught at the University of Chicago, where he was from 1995 to 1998 the chair of the economics department, and beginning in 1997 the Alvin H. Baum Distinguished Service Professor of Economics. From 1987–88, he was vice president of the Financial Strategies Group at Goldman, Sachs & Co. He has been a visiting professor at College de France, 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, he held a Blaise Pascal Research Chair (France). His current research interests are the determinants of the size of the financial industry, asset-price bubbles, and developing tools for empirical studies of asset markets.

COURSES TAUGHT
- ECO 502 Microeconomic Theory II
- ECO 525/FIN 595: Financial Economics
- ECO 493/FIN 593: Financial Crises

REPRESENTATIVE PUBLICATIONS

HYUN SONG SHIN is the Hughes-Rogers Professor of Economics at Princeton University. Before coming to Princeton in 2006, he was a professor of finance at the London School of Economics. His recent research has focused on the current credit crisis and the role of risk management techniques and accounting rules in the crisis dynamics. His broader research interests are in financial economics, especially in issues related to disclosures, financial regulation, crises, and financial stability, issues on which he has advised central banks and policy institutions. He is a fellow of the Econometric Society and the British Academy. He received his Ph.D. from the University of Oxford in 1988. He was on leave during the academic year 2009–10, serving as an adviser to President Lee Myung-bak of South Korea.

COURSES TAUGHT
- FRS 114: Recent Developments in Financial Regulations: International Dimensions”
- FIN 502: Corporate Finance and Financial Accounting
- FIN 591/ECO 491: Cases in Financial Risk Management
- FIN 596/ECO 526: Financial Economics II
UNDERGRADUATE STUDENT ADVISED
• Tiao Guan, “Price Divergence between Dual-listed A and H-shares: The Roles of Speculation, Market Liquidity, and Arbitrage”

GRADUATE STUDENTS ADVISED
• Sergey Zhuk, “Three Essays in Financial Economics”

REPRESENTATIVE PUBLICATIONS
• Risk and Liquidity, Clarendon Lectures in Finance, 2009, Oxford University Press

CHRISTOPHER SIMS is the John F. Sherrerd’52 University Professor of Economics. 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 served as president and as co-editor of Econometrica. He became president elect of the American Economic Association in 2011 and serves as president during 2012. He was with Thomas Sargent, the co-recipient of the 2011 Nobel Prize in Economics. He has intermittently served as an 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.

COURSES TAUGHT
• ECO 342: Money and Banking I
• ECO513: Advanced Econometrics: Time Series Models
• ECO 521: Macroeconomic Theory I
• ECO 522: Advanced Macroeconomic Theory II

UNDERGRADUATE STUDENTS ADVISED
• Neha Bansal, “How Safe is the Safety Net? Access to Care in the Emergency Room”
• Scott Gates: “Faculty Salaries and University Finances: How Selected Public and Private Universities Change the Composition and Compensation of Their Faculties Based on Financial Resources”
• Anna Liu, “Size, Profitability and Risk: A Macroeconomic Perspective on Microfinance Institution Performance”
• Albulen Pano, “The Privatization of Drinking Water: The Effect of Ownership on Water System Regulatory Compliance in the USA”
REPRESENTATIVE PUBLICATIONS


RONNIE SIRCAR is a professor of operations research and financial engineering. He received his doctorate from Stanford University, and taught for three years at the University of Michigan in the Department of Mathematics before coming to Princeton. He has received continuing National Science Foundation research grants since 1998. He was a recipient of the E-Council Excellence in Teaching Award for his teaching in 2002, 2005, and 2006 and the Howard B. Wentz Jr. Junior Faculty Award in 2003. His research interests center on financial mathematics, stochastic volatility models, credit risk, asymptotic and computational methods, portfolio optimization and stochastic control problems, stochastic differential games and energy and commodities markets.

GRADUATE STUDENTS ADVISED

• Andrew Ledvina, “Differential Games in Oligopolistic Markets”
• Edmond Choi, “Credit & Equity Derivatives”
• Mike Stein, “Energy and Commodity Markets”

REPRESENTATIVE PUBLICATIONS

• “Dynamic Bertrand Oligopoly,” Applied Mathematics and Optimization 63(1), 2011, pp 11-44 (with A. Ledvina).
• “From Smile Asymptotics to Market risk Measures,” submitted July 2011 (with S. Sturm).

DAVID SRAER joined the faculty at the Department of Economics at Princeton University in 2009 and teaches courses in corporate finance for the master’s and the Ph.D. programs. He received his B.S. in applied mathematics and economics from École Polytechnique in 2001 and his Ph.D. in economics from the Toulouse School of Economics in 2007. His research has been published in leading journals in economics and finance such as the American Economic Review, Review of Economic Studies, The Journal of Finance, and the Journal of Financial Economics. It has covered topics such
as: the role of collateral value on firms’ investment decisions; the importance of family ownership for corporate behavior; the impact of retail investing on idiosyncratic volatility; and the role of dissent in organizations. Sraer is an associate editor for the *Journal of the European Economic Association* and has served as ad hoc referee for leading journals in both economics and finance.

**COURSES TAUGHT**
- FIN 502: Corporate Finance and Financial Accounting
- ECO 526/FIN 596: Corporate Finance

**UNDERGRADUATE STUDENTS ADVISED**
- Christian Blake, “Family Firm Performance: Evidence from the S&P During the Financial Crisis”
- Alec Finley, “Variation in Firm Value in Response to Credit Constraints”
- Steve Low, “Mergers, Acquisitions, & Shareholder Wealth”

**REPRESENTATIVE PUBLICATIONS**

KENNETH STEIGLITZ, the Eugene Higgins Professor of Computer Science, received his doctorate in 1963 from New York University and has been teaching at Princeton ever since. He is a fellow of the Institute of Electrical and Electronics Engineers (1981), a fellow of the Association for Computing Machinery (1997), and a recipient of the Technical Achievement Award of the Signal Processing Society (1981), the Signal Processing Society Award (1986), the IEEE Centennial Medal (1984), the School of Engineering Distinguished Teacher Award (1997), and the IEEE Third Millennium Medal (2000). His current research interests are in agent-based modeling of markets, auctions, and computing using soliton collisions. Kenneth Steiglitz has transferred to emeritus status and continues to work on emergent behavior in agent-based macro-economic models.

**COURSES TAUGHT**
- COS 126/EGR 126: General Computer Science

**UNDERGRADUATE STUDENTS ADVISED**
- Zhihong Xu “Redesigning EOS: Developing a Realistic Baseline for the Economics via Object-oriented Simulation Framework”
Robert Vanderbei has been a professor in the Department of Operations Research and Financial Engineering since its creation in 1999 and is the chair until July 1, 2012. His research interests focus on 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 an associate editor for both *Optimization in Engineering* and *Mathematical Programming*. He is a member of the Mathematical Optimization Society, SPIE, and the American Astrophysical Society. He is a Fellow of the Society for Industrial and Applied Mathematics and he is a Fellow of the Institute for Operations Research and Management Science. He received his Ph.D. in applied mathematics from Cornell University in 1981.

COURSES TAUGHT
- ORF 522: Linear Optimization
- ORF 307: Optimization

UNDERGRADUATE STUDENTS ADVISED
- James Connolly, “A Regression Analysis of Madden NFL Team and Player Ratings”
- Sook Yung Kim, “Sovereign Wealth Funds: Their Performance in Global Financial Markets and its Implications for Regulatory Controls”
- Chetan Narain, “Predicting Politics: A Mathematical Approach to Parsing and Evaluating Presidential Campaign Speeches”
- Kexing (Christina) Ren, “An Analysis of Wireless Telecommunication Churn Rates Using data Mining Methods”

REPRESENTATIVE PUBLICATIONS

ERIK VANMARCKE is a professor of civil and environmental engineering. He received his doctorate from the Massachusetts Institute of Technology in 1970 and joined the faculty, remaining there until 1985. At MIT, he was the Gilbert W. Winslow Career Development Professor and served as director of the Civil Engineering Systems Methodology Group. He has held visiting appointments at Harvard University, Technical University of Delft (the Netherlands), and University of Leuven (Belgium), his undergraduate alma mater, and was the Shimizu Corporation Visiting Professor at Stanford University. He presently holds the Kwang-Hua Chair Visiting Professorship at Tongji University in Shanghai, China. His principal expertise is in risk assessment and applied systems science. He authored Random Fields: Analysis and Synthesis, originally published by MIT Press; the second (revised and expanded) was published in 2010 by World Scientific Company. He won several research prizes of the American Society of Civil Engineers and chaired its Council on Disaster Risk Management. He 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 362: Structural Dynamics and Earthquake Engineering
• CEE 558: Applied Random Fields

GRADUATE STUDENTS ADVISED
• Ning Lin, Ph.D. 2010
• Siu-Chung Yau 2011

REPRESENTATIVE PUBLICATIONS
• “Quantitative Risk Analysis of Damage to Structures during Windstorms: Some Multi-scale and System Reliability Effects,” Keynote Lecture, Proceedings International Symposium on Reliability Engineering and Risk Management, Shanghai, China; Published by Tongji University Press, pp. 93-101, 210, (with E. Lin, N. and Yau, S.C.)
• “Quantitative Risk Analysis Applied to Dams,” Proceedings of the 4th Civil Engineering Conference in the Asian Region (CECAR-4), Taipei, June 2007; Published by the Asian Civil Engineering Coordinating Council (ACECC), pp. 17-21, 2007; also CDRM Monograph No. 5, ASCE, 2010.

**MARK WATSON** is the Howard Harrison and Gabrielle Snyder Beck Professor of Economics and Public Affairs in the Department of Economics 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 received the Galbraith Award for Graduate Teaching in 1986 and the McGraw Center Graduate Mentoring Award in 2008. 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**
- ECO 313: Econometric Applications
- ECO 517: Econometric Theory I
- ECO 518: Econometric Theory II
- WWS507B: Quantitative Analysis (Basic)
- WWS507C: Quantitative Analysis (Advanced)

**UNDERGRADUATE STUDENTS ADVISED**
- Rebecca Scharfstein: “The Effect of Mortgage Credit Expansion on Residential Energy Consumption in California”

**REPRESENTATIVE PUBLICATIONS**

**WEI XIONG** is a professor of economics in the Department of Economics. His research interests center on capital market imperfections. His earlier papers cover speculative bubbles induced by heterogeneous beliefs and short-sales constraints, effects of stock price bubbles on managerial incentives and firm investment, asset market contagion, limited investor attention, non-standard investor preferences, asset pricing with heterogeneous beliefs and rollover risk and dynamic coordination problems between creditors. He is currently researching financialization of commodities markets, belief distortions in the recent financial crisis, and China’s financial markets. He received his Ph.D. from Duke University in 2001. He is a research associate of the National Bureau of Economic Research and was the finance editor of *Management Science.*
COURSES TAUGHT
• FIN 522/ECO 465: Futures, Options, and Financial Derivatives
• FIN 595/ECO 525: Financial Economics I
• FIN 593/ECO 493: Financial Crises
• FIN S500: Math Camp for MIF Students

UNDERGRADUATE STUDENTS ADVISED
• Zeynep Guner Gul, “Incentives, Compensations and Risk-Taking”
• Tiffany Liu, “The Effect of Mergers and Acquisitions on Executive Compensation”

GRADUATE STUDENTS ADVISED
• Ing-haw Cheng, “Essays in Corporate Governance and Capital Markets”
• Adam Zawadowski, “Essays in Finance”
• Andrew Robinson, “Essays on Financial Liquidity and Risk”

REPRESENTATIVE PUBLICATIONS
VISITING FACULTY

During the academic year 2011–12, the Bendheim Center for Finance welcomed the following visiting faculty:

**TOBIAS ADRIAN** is a Vice President of the Federal Reserve Bank of New York, with the Capital Markets Function of the Research Group. His research covers asset pricing, financial intermediation, and macroeconomics, with a focus on the aggregate implications of capital market developments. He has contributed to the NY Fed’s financial stability policy and to its monetary policy briefings. Tobias Adrian holds a Ph.D. from MIT and an MSc from LSE. He has taught at MIT and Princeton University.

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

**JEAN-CHRISTOPHE DE SWAAN** has been teaching at Princeton since the Spring of 2009 as a Lecturer. He teaches a joint undergraduate and graduate course, The Rise of Asian Capital Markets, and a Freshman seminar, Ethics in Financial Markets. He also teaches at the University of Cambridge and has taught at Yale University, Cheung Kong Business School and Renmin University in Beijing. He is also a Principal at Cornwall Capital, a multi-strategy hedge fund based in New York. Prior to that, he was a special adviser on China at a global macro hedge fund, a Principal at an Asia-dedicated hedge fund, and a consultant at McKinsey & Company. He received his B.A. from Yale University, an MPhil in International Relations from the University of Cambridge, and a Masters in Public Policy from Harvard University’s Kennedy School of Government. He is a Member of the Council on Foreign Relations. He is a faculty advisor in Rockefeller College (Princeton University) and an Associate Fellow of Ezra Stiles College (Yale University).

**COURSES TAUGHT**
- FRS139: Ethics in Financial Markets
- ECO 492/FIN 592: The Rise of Asian Capital Markets

**MARC HALLIN** was a visiting research scholar in the operations research and financial engineering department and the Bendheim Center for Finance for the spring and fall semesters. He spent most of his career at the Mathematics Department of the Université libre de Bruxelles. His research interests are in non- and semiparametric inference, the asymptotic theory of statistical experiments, and time series analysis. A fellow of the Institute of Mathematical Statistics and the American Statistical Association, he is member of the Classe des Sciences of the Royal Academy of Belgium.

**COURSE TAUGHT**
- ORF524: Statistical Theory & Methods
JEAN JACOD visited Princeton during the spring semester. He is a professor in the faculty of mathematics of Université Pierre et Marie Curie (Paris-6). After receiving a Ph.D. from this university, he held a position at the École des Mines de Paris in the geostatistics department, then was professor at Rennes and École Polytechnique (Paris), and then at Paris-6 since 1983. His interests are generally in stochastic processes and stochastic integration, with a number of applications to mathematical finance and to statistics of stochastic processes. Recently, he also worked on high-frequency statistics, with special emphasis on financial applications.

COURSE TAUGHT
- ECO 575: Topics in Financial Economics

WILLIAM JANEWAY is Senior Advisor at Warburg Pincus. He joined Warburg Pincus in 1988 and was responsible for building the information technology investment practice. Previously, he was executive vice president and director at Eberstadt Fleming. Dr. Janeway is a director of Magnet Systems, Nuance Communications, O’Reilly Media, and a member of the Board of Managers of Roubini Global Economics.

Dr. Janeway is Chairman of the Board of Trustees of Cambridge in America, University of Cambridge and a Member of the Board of Managers of the Cambridge Endowment for Research in Finance (CERF). Dr. Janeway is a member of the board of directors of the Social Science Research Council and the board of governors of the Institute for New Economic Thinking and of the Advisory Boards of the Princeton Bendheim Center for Finance and the MIT-Sloan Finance Group. He is the author of Doing Capitalism in the Innovation Economy: Markets Speculation and the State, to be published by Cambridge University Press in October 2012.

Dr. Janeway received his doctorate in economics from Cambridge University where he was a Marshall Scholar. He was valedictorian of the class of 1965 at Princeton University.

COURSE TAUGHT
- ECO 493/FIN 593 – Financial Crises

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. Sexton graduated from Princeton 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 1995, he became an active advisory director of Morgan Stanley. Also in 1995, he became an adjunct professor at Columbia University’s Graduate School of Business, teaching two courses in the subject of corporate finance. In 2000, he became a visiting lecturer at Princeton. Sexton is a member of the board of directors of Morgan Stanley, and he is a director of Investor AB, a publicly traded company based in Stockholm, Sweden, and of one other privately held company.

COURSE TAUGHT
- ECO 464/FIN 519: Corporate Restructuring
STAFF

**WENDELL COLLINS** is the director of corporate relations for the Bendheim Center for Finance. Before joining the center in 2007, she worked in Princeton’s Office of Development and Office of the Dean for Research. Before joining the University, Collins spent 11 years at Merrill Lynch in marketing, training, and business development, as well as serving in various management roles at Dow Jones and the Associated Press. Her responsibilities with the center include i) managing the Corporate Affiliates Program, which seeks support for the 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 center, and iv) promoting and organizing special events involving alumni and advisory council members. She received her undergraduate degree in journalism and political science from the University of North Carolina–Chapel Hill.

**ELLEN DIPIPPO** is the Academic Administrator for the Bendheim Center for Finance. Before joining Princeton in 2008, Ellen held several administrative positions in both the private and academic sector, including the Economics Graduate Administrator at Harvard University and Economic Recruiter at the Brattle Group in Washington, DC. She earned her Bachelor of Music in Education from Youngstown State University, Ohio.

**KAREN NEUKIRCHEN** is the Center Administrator for the Bendheim Center for Finance. She joined the Princeton Economics Department in 1986 and has been with Bendheim Center since 2000. She was previously employed by Mobil Oil Corporation, Hazeltine Corporation, and FMC. She graduated from Rider University in 2006 with a degree in Business Administration.

**JESSICA H. B. O’LEARY** is the Center Manager for the Bendheim Center for Finance. In that role she oversees the day to day functions of the Bendheim Center for Finance including its facility in the Old Dial Lodge. She has worked at Princeton for 14 years, including three years in Molecular Biology and nine years in Mechanical & Aerospace Engineering as the Graduate Program Administrator. She is a graduate of Rider University with a BA in business management.
PH.D. STUDENTS
GRADUATING 2011-12
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. Ten Ph.D. students graduated in 2011.

**José Azar** received his Ph.D. from the department of economics. His thesis was titled “A New Look at Oligopoly: Implicit Collusion through Portfolio Diversification.” He has accepted a senior associate position with Charles River Associates.

**Dong Beom Choi** received his Ph.D. from the department of economics. His thesis was titled “Essays in Financial Economics.” He accepted a position as economist, financial intermediation function with the New York Federal Reserve Bank.

**Hyun Soo Choi** received his Ph.D. from the department of economics. His thesis was titled “Three Essays on Real Estate Finance.” He accepted an assistant professor of finance position with the Singapore Management University.

**Weijie Gu** received his Ph.D. from the operations research and financial engineering department. His thesis was titled “Estimating False Discovery Proportion under Covariance Dependence.” He accepted an associate position with Barclays Capital.

**Andrew Robinson** received his Ph.D. from the department of economics. His thesis was titled “Essays on Financial Liquidity and Risk.” He accepted an associate position with BlackRock Scientific.

**Martin Schmalz** received his Ph.D. from the department of economics. His thesis was titled “Three Essays in Financial Economics.” He accepted an assistant professor of finance position at the University of Michigan, Ross School of Business.

**Warren Scott** received his Ph.D. from the operations research and financial engineering department. His thesis is titled “Energy Storage Application of the Knowledge Gradient for Calibrating Continuous Parameters, Approximate Policy Iteration Using Bellman Error Minimization with Instrumental Variables, Covariance Matrix Estimation Using an Error-in-Variables Factor Model.” He accepted a post doc research position with the Lawrence Livermore National Laboratory.

**Xin Tong** received his Ph.D. from the operations research and financial engineering department. His thesis is titled “Learning with Asymmetry, High Dimension and Social Networks.” He has accepted a statistics instructor position with MIT, department of mathematics.
MING YANG received his Ph.D. from the department of economics. His thesis is titled “Flexible Information Acquisition in Strategic Situations.” He has accepted an assistant professor in finance position at Fuqua School of Business, Duke University.

SERGEY ZHUK received his Ph.D. from the department of economics. His thesis is titled “Three Essays in Financial Economics.” He accepted an assistant professor in finance position at the University of Vienna.
2011–12
SEMINARS
AND CONFERENCES
CIVITAS FOUNDATION FINANCE SEMINARS

Each week, Bendheim Center for Finance organizes a seminar in which academic experts are invited to present their latest research to the faculty and graduate students of the center. The seminar usually meets on Wednesdays, 2:50–4 p.m., in the Bendheim Center for Finance classroom.

FALL 2011

**September 21**
José Azar, Princeton University  
“Diversification, Shareholder Value Maximization, and Competition: A Trilemma”

**October 5**
Jerome Powell (Advisory Board, Bendheim Center for Finance)  
“Dodd Frank and Too Big to Fail”

**October 11**
Sergey Zhuk, Princeton University  
“Bubbles and Reinvestment”

**October 12**
Hyun Soo Choi, Princeton University  
“The Impact of Anti-Predatory Lending Laws on Mortgage Volume”

**October 18**
Martin Schmalz (special day and time: Tuesday, 12:20-1:30 p.m.)  

**October 19**
Dong Beom Choi, Princeton University  
Topic: “Heterogeneity and Stability: Bolster the Strong Not the Weak”

**October 21**
Ming Yang, (special day and time: Tuesday, 12:20-1:30 p.m.)  
“Optimality of Securitized Debt with Endogenous and Flexible Information Acquisition”

**November 16**
Francis Longstaff, UCLA  
“Systemic Sovereign Credit Risk: Lessons from the U.S. and Europe”

**November 30**
Leonid Kogan, MIT  
“Investment-specific Shocks, Firm Characteristics, and the Cross-section of Returns: (with Dimitris Papanikolaou)”

**December 7**
Marianne Bertrand, University of Chicago (joint with Labor Seminar)  
“Trickle-Down Consumption”

**December 14**
Antoinette Schoar, MIT  
“Credit Supply and House Prices: Evidence from Mortgage Market Segmentation” (with Felipe Severino)

SPRING 2012

**February 29**
Or Shachar, New York University  
“Exposing the Exposed: Intermediation Capacity in the Credit Default Swap Market”

**March 1**
Thomas Mariotti, IDEI, Toulouse School of Economics (Joint with Microeconomics Theory)  
“Nonexclusive Competition under Adverse Selection”

**March 7**
Thomas Philippon, New York University  

**March 28**
Nicola Garleanu (University of California—Berkeley)  
“Young, Old, Conservative, and Bold: The Implications of Heterogeneity and Finite Lives for Asset Pricing”

**April 4**
David Hirschleifer (University of California – Irvine)  
“Self-Enhancing Transmission Bias and Active Investing”

**April 11**
Monika Piazzesi (Stanford University)  
“The Allocation of Interest Rate Risk and the Financial Sector”

**April 25**
Lionel Martellini (EDHEC), visiting Princeton  
“Slicing and Dicing Investor Welfare Across and Within Asset Classes”

**May 2**
Hanno Lustig (University of California, Los Angeles)  
“Countercyclical Currency Risk Premia” (with Nikolai Roussanov and Adrien Verdelhan)
FINANCE PH.D. STUDENT WORKSHOP

Each week, the Bendheim Center for Finance organizes a seminar for its Ph.D. students and faculty in which preliminary research ideas are presented internally. The seminar usually meets on Tuesdays, 12:30–1:30 p.m., in the Bendheim Center for Finance library.

FALL 2011

September 27
Dong Beom Choi
“Contagious Bank Runs: Which Bank to be Recapitalized?”
Gonzalo Cisternas
“A Continuous-time Model of Career Concerns and Human Capital Accumulation”

October 4
Jean-Noel Barrot, HEC Paris
“Investor Horizon and Limits of Arbitrage: Evidence from Private Equity Funds”

October 11
Sergey Zhuk
“Bubbles and Reinvestment”

October 18
Martin Schmalz
“Financing Human and Organizational Capital: Evidence from Unionization Elections”

October 25
Ming Yang
“Optimality of Securitized Debt with Endogenous and Flexible Information Acquisition”

November 8
Jakub Jurek
“The Cost of Capital for Alternative Investments”

November 15
Yi Li
“The Role of Reputation on PE Fund Size and Performance”
José Azar
“Changes in the Opportunity Cost of Cash: A Solution to the Corporate Cash Hoarding Puzzle” (with Jean-Francois Kagy)

November 22
Constantinos Kalfarentzos
“Endogenous Fund Flows and Managerial Tournament Behavior under High Watermark Contracts” (with Filippos Papakonstantinou)
John Kim
“Welfare Economics with Heterogeneous Beliefs”

November 29
Dacheng Xiu
“A Tale of Two Option Markets: State-price Densities Implied from S&P 500 and VIX Option Prices”
Olivier Darmouni
“Can Contracting Prevent Traders from Neglecting Risks?”
February 7
Michael Hasler
“Portfolio Choice and Costly Dynamic Information Acquisition”

April 10
Zhenyu Gao
“Real Estate Investors and the Boom and Bust of the U.S. Housing Market”

José Azar
“Common Shareholders and Interlocking Directorships: The Relation between Two Corporate Networks”

February 21
Yi Li
“What Drives Persistence in Private Equity Fund Performance?”

April 17
Ji Huang
“Financial Intermediation and Off-balance Sheet Financing”

March 6
Weicheng Lian
“Why Do Households Trade Risky Mortgages? A New Perspective from Risk Sharing”

April 24
Wei Cui
“Financial Friction and Selling Friction”

Kevin Webster
“A Belief Driven Order Book Model”

March 13
Vicky Liu
“Trade Credit in the Absence of Immediate Credit Constraint”

May 15
Per Mykland (University of Chicago)
“Between Data Cleaning and Inference: Pre-averaging and Other Robust Estimates of the Efficient Price” (with Lan Zhang)

March 27
Rohit Lamba
“Dynamic Market for Lemons”

2011 PRINCETON LECTURES IN FINANCE

Each year, the Bendheim Center invites a leading figure in the field of finance to deliver a set of lectures at Princeton on a topic of major significance to researchers and professionals. The published lectures will appear as a Princeton University Press book. The lectures are open to the public and held in the BCF classroom.


Lecture 1:
A Next-Generation Solution for Funding Retirement: A Case Study in Design and Implementation of Financial Innovation

Lecture 2:
Financial Innovation in Residential Housing Finance: Funding, Risk Transfer, and Efficient Asset Use.

Lecture 3:
PRINCETON INITIATIVE: MACRO, MONEY AND FINANCE

September 9-10, 2011, Princeton University
Taylor Auditorium, Frick Chemistry Laboratory

Friday, September 7, 2012

Liquidity Concepts: Amplification, Persistence and Asymmetry
Markus Brunnermeier

Heterogeneous Agent Models with Financial Frictions: A Continuous Time Approach
Yuliy Sannikov

Financial Frictions: Empirical Facts
David Sraer

Productivity Losses from Financial Frictions
Ben Moll

Rollover Risk, Credit Risk, and Debt Runs
Wei Xiong

Bubbles and Imbalances
Markus Brunnermeier

Saturday, September 8, 2012

Demand for Liquid Assets
Markus Brunnermeier

The I Theory of Money
Markus Brunnermeier

The Fiscal Theory of the Price Level
Chris Sims

International Macro: Capital Flows and Asset Prices
Nobuhiro Kiyotaki

Global Liquidity
Hyun Shin

Sunday, September 9, 2012

The Fiscal Theory of the Price Level
Chris Sims

International Macro: Capital Flows and Asset Prices
Nobuhiro Kiyotaki

Global Liquidity
Hyun Shin
SEVENTH CAMBRIDGE-PRINCETON CONFERENCE

This conference, the sixth in the series, brought together faculty from Princeton’s Bendheim Center for Finance and the Cambridge Endowment for Research in Finance, thanks to generous support from William H. Janeway ’65.

The conference took place on September 16-17, 2011, at the Bendheim Center for Finance.

Friday September 16, 2011

Session Chair: Bill Janeway
Mike Tehranchi, “An Equilibrium Market Model with Learning
Discussant: René Carmona

Wei Xiong (with Ing-haw Cheng and Andrei Kirilenko), “Endogenous Risk and the Seismology of Commodity Futures Markets”
Discussant: Raghu Rau

Session Chair: David Sraer
Chris Rogers (with Katsumasa Nishide), “Market Selection: Hungry Misers and Happy Bankrupts”
Discussant: Tobias Adrian
Discussant: Elena Medova

Session Chair: Andrew Harvey
Hashem Pesaran (with Takashi Yamagata), “Testing CAPM with a Large Number of Assets”
Discussant: Yuan Liao

Birgit Rudloff (with Andreas Loehne), “An Algorithm for Calculating the Set of Superhedging Portfolios and Strategies in Markets with Transaction Costs”
Discussant: Chris Rogers

Session Chair: Hyun Song Shin
Amir Amel-Zadeh (with Baruch Lev and Geoff Meeks), “The Role of Management Forecasts During Mergers and Acquisitions”
Discussant: Darius Paia

Patrick Cheridito (with Ulrich Horst, Michael Kupper and Traian Adrian Pirvu), “Equilibrium Pricing in Incomplete Markets Under Translation Invariant Preferences”
Discussant: Mike Tehranchi

Session Chair: John Eatwell
Michael Dempster (with Elena Medova and J. Roberts), “Regulating Complex Derivatives: Can the Opaque Be Made Transparent?”
Discussant: Markus Brunnermeier

Yacine Aït-Sahalia, “The Leverage Effect Puzzle: Disentangling Sources of Bias at High Frequency”
Discussants: Andrew Harvey

Saturday September 17, 2011

Session Chair: Andrew Harvey
Hashem Pesaran (with Takashi Yamagata), “Testing CAPM with a Large Number of Assets”
Discussant: Yuan Liao

Birgit Rudloff (with Andreas Loehne), “An Algorithm for Calculating the Set of Superhedging Portfolios and Strategies in Markets with Transaction Costs”
Discussant: Chris Rogers

Session Chair: Hyun Song Shin
Amir Amel-Zadeh (with Baruch Lev and Geoff Meeks), “The Role of Management Forecasts During Mergers and Acquisitions”
Discussant: Darius Paia

Patrick Cheridito (with Ulrich Horst, Michael Kupper and Traian Adrian Pirvu), “Equilibrium Pricing in Incomplete Markets Under Translation Invariant Preferences”
Discussant: Mike Tehranchi

Session Chair: Ronnie Sircar
Discussant: Simi Kedia

Jianqing Fan (with Yuan Liao and Martina Mincheva), “High Dimensional Covariance Matrix Estimation in Approximate Factor Models”
Discussant: Vanessa Smith

Session Chair: John Eatwell
Michael Dempster (with Elena Medova and J. Roberts), “Regulating Complex Derivatives: Can the Opaque Be Made Transparent?”
Discussant: Markus Brunnermeier

Yacine Aït-Sahalia, “The Leverage Effect Puzzle: Disentangling Sources of Bias at High Frequency”
Discussants: Andrew Harvey
SECOND PRINCETON UNIVERSITY HIGH FREQUENCY AND QUANTITATIVE TRADING CONFERENCE

This conference was organized by Princeton University Graduate Students from Operations Research and Financial Engineering, Economics, Mathematics and Computer Science on March 31, 2012 at the Friend Center.

Featured Speakers:

Ms. Irene Aldridge, Managing Partner, Able Alpha
Dr. Robert Almgren, Co-founder and Head of Research, Quantitative Brokers
Mr. Ugur Arslan, Founder and Managing Member, Aientech
Mr. Matthew Andresen, Co-founder and CEO, Headlands Technologies
Mr. Steve Crutchfield, CEO, NYSE Amex Options
Dr. Matt Cushman, Senior Managing Director, Citadel
Mr. Daniel Kenna, Managing Director, Morgan Stanley
Dr. AJ Lindeman, Managing Director, Benchmark Solutions
Mr. Peter Nabicht, Executive Vice President, Allston Trading
Dr. Daniel Nehren, Global Head of Linear QR, JPMorgan Chase
Dr. Alex Reyfman, Director, Barclays Capital
Mr. Ryan Sheftel, MD, Global Head of Rates Electronic Trading, Credit Suisse
Dr. Michael Sotiropoulos, MD, Global Head of Algorithmic Trading Research, Bank of America Merrill Lynch
Mr. Shane Swanson, Partner and General Counsel, Eladian Partners

Featured Panelists:

Ms. Unson Allen, Head of Recruitment for the Electronic Trading Group, Knight Capital Group
Mr. Eric Greiner, Director, Quantitative Prime Brokerage, Barclays Capital
Dr. Ann Guo, Head of Campus Recruiting, GETCO LLC
Mr. Brennan Hughes, Partner, World Wide Financial Industry Recruiting Services
Mr. Trent Krupp, Partner, Constitution Group LLP
Ms. Katy Lederer, Founder and Managing Partner, Intelligent Alternatives LLC
Mr. Bill Lyon, CTO, Prediction Company
Mr. Ryan Sheftel, Head of Electronic Market Making, Credit Suisse
Mr. Eliot Smith, Senior Consultant, Quantitative and Electronic Trading, NJF Search
Dr. Michael Sotiropoulos, MD, Global Head of Algorithmic Trading Research, Bank of America Merrill Lynch
Inaugural Julis-Rabinowitz Center Conference

“European Crisis: Historical Parallels and Economic Lessons”
April 19-20, 2012, Princeton University

Thursday, April 19, 2012
Welcome – Markus Brunnermeier

Chris Sims, “Gaps in the Institutions of the Euro Area”

Ricardo Reis, Columbia University
“Can a Central Bank with Negative Capital Still Be effective?”

Harold James, “Lessons for the Euro from History”
Chair: Hyun Shin, Princeton University

Luis Garicano, London School of Economics
“The Spanish Variant of the Dutch Disease”

Tano Santos, Columbia University
“Domestic Banking in a Monetary Union: The Spanish Case”
Chair: David Thesmar, HEC Paris
Keynote Speech – Paul Krugman, “Europe’s Two Depressions”

Friday, April 20, 2012
Hans-Werner Sinn, University of Munich
“The Euro Crisis”

Chair: Mark Aguilar
Keynote Address - Benoit Coeure, European Central Bank
“Risk Sharing in EMU: before, during and after the Crisis”

Policy Panel - “Current Events in Europe”
Jean-Pierre Landau, Princeton University
“Internal Imbalances in the Eurozone”

Ashoka Mody, IMF
“Banks in the Eurozone and Capital Flows’ Reversal”

Jacob Goldfield
“Did the Three Year LTROs Really Cause the Yield Decline?”

Christian Kastrop, German Ministry of Finance
“Eurozone: What Strategy Against Failure?”

Franklin Allen, University of Pennsylvania
“How Will the Eurozone Emerge from the Crisis?”

EDHEC-Princeton Institutional Money Management Conference

April 27, 2012
Princeton Club of New York

Paradigm shifts in the investment industry: from alpha to beta Management—Lionel Martellini

New frontiers in equity investments: Equity portfolio construction using better constraints—Raman Uppal

New frontiers in fixed-income investments: New forms of fixed-income benchmarks for performance-seeking and liability-hedging portfolios—Frank J. Fabozzi

New frontiers in commodity investments: From static long-only to dynamic long-short investment strategies—John Mulvey

Hedging versus insurance: Long-term investing with short-term constraints—Lionel Martellini

Asset allocation decisions in the presence of regime Switches—René Garcia

Portfolio selection with alternatives—Jakub Jurek

Asset allocation and risk management in a world where all asset classes can fail together—Yacine Aït-Sahalia
7TH OXFORD-PRINCETON WORKSHOP ON
FINANCIAL MATHEMATICS & STOCHASTIC ANALYSIS

April 27-28, 2012 Princeton University, Sherrerd Hall

April 27
Mete Soner (ETH Zurich)
Recombinant Tree Approximation of Stochastic Volatility Models

Terry Lyons
The Expected Signature of a Stopped Brownian Motion

Dmitry Kramkov
Integral Representation of Martingales and Endogenous Completeness of Financial Models

Xunyu Zhou
Arrow-Debreu Equilibria for Rank-Dependent Utilities

Patrick Cheridito
Systemic Risk Management

Shige Peng
Risk Measures and Accumulated Model Uncertainty

Michael Coulon
Spread Option Pricing in Electricity Markets

Hyun Shin

Gechun Liang
Long Time Optimal Portfolios: An Ergodic Quadratic BSDE Approach

Greg Gyurko
Monte Carlo Methods via a Dual Approach for Some Discrete Time Stochastic Control Problems

April 28
Ronnie Sircar
Stochastic Volatility Portfolio Asymptotics

Christoph Reisinger
Piecewise-Constant Control Approximation to Multi-Dimensional HJB Equations

Harrison Hong
Speculative Betas

Johannes Ruf
Hedging Options On Exploding Exchange Rates

Jeremy Large
Markov Perfect Bayesian Equilibrium via Ergodicity

Nicolas Victoir, (JP Morgan Chase)
A Local Volatility Model in Rates

Sergey Nadtochiy
Robust Static Hedging of Barrier Options with Beliefs

Matt Lorig
Variance Swaps on Lévy Subordinated Diffusion Processes

Mike Monoyios
Malliavin Calculus Method for Asymptotic Expansions of Indifference Prices

Vladimir Cherny
Portfolio Optimization Under Nonlinear Drawdown Constraint in a General Semimartingale Market

Zachary Feinstein
Time Consistency in Markets with Transaction Costs

Zhenyu Gao
Real Estate Investors and the Boom and Bust of the US Housing Market

Martina Mincheva
Large Covariance Estimation by Thresholding Principal Orthogonal Complements

Oleskii Mostovyi
Necessary & Sufficient Conditions in the Problem of Optimal Investment with Intermediate Consumption

Kevin Webster
A Belief Driven Order Book Model

Rasmus Wissmann
A PCA-based Approach for High-Dimensional PDEs in Derivative Pricing
UNDERGRADUATE CERTIFICATE IN FINANCE
In 1999, the Bendheim Center for Finance started offering an Undergraduate Certificate in Finance (UCF) to Princeton undergraduates. The certificate program in finance has four major components:

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

Now in its 15th year, the Undergraduate Certificate in Finance continues to do extremely well. We currently have 104 students in the Class of 2013 and enrolled 100 juniors from the Class of 2014. This will bring our total number of undergraduate students in the program (juniors and seniors) to 204 for the coming academic year. This number is subject to change, as we often have students who apply and are admitted mid-year. Students earning the certificate are drawn from a wide cross-section of departments on campus, testifying both to the interdisciplinary flavor of the program and its wide appeal. The breakdown by major is given in the following two tables.

**CLASS OF 2012**

Total number of certificates awarded: 71 (17 to women or 24 percent)

<table>
<thead>
<tr>
<th>Major</th>
<th>Number of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical Engineering</td>
<td>3</td>
</tr>
<tr>
<td>Computer Science</td>
<td>3</td>
</tr>
<tr>
<td>Economics</td>
<td>36</td>
</tr>
<tr>
<td>Electrical Engineering</td>
<td>2</td>
</tr>
<tr>
<td>English</td>
<td>1</td>
</tr>
<tr>
<td>Geosciences</td>
<td>1</td>
</tr>
<tr>
<td>History</td>
<td>1</td>
</tr>
<tr>
<td>Mathematics</td>
<td>2</td>
</tr>
<tr>
<td>Mechanical and Aeronautical Engineering</td>
<td>1</td>
</tr>
<tr>
<td>Operations Research and Financial Engineering</td>
<td>16</td>
</tr>
<tr>
<td>Philosophy</td>
<td>1</td>
</tr>
<tr>
<td>Politics</td>
<td>1</td>
</tr>
<tr>
<td>Psychology</td>
<td>1</td>
</tr>
<tr>
<td>Woodrow Wilson School</td>
<td>2</td>
</tr>
</tbody>
</table>
**CLASS OF 2013**
Total expected number of certificates to be awarded: 104 (31 to women, or 30 percent)

<table>
<thead>
<tr>
<th>Major</th>
<th>Number of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anthropology</td>
<td>1</td>
</tr>
<tr>
<td>Art</td>
<td>1</td>
</tr>
<tr>
<td>Chemical and Biological Engineering</td>
<td>2</td>
</tr>
<tr>
<td>Chemistry</td>
<td>1</td>
</tr>
<tr>
<td>Computer Science</td>
<td>8</td>
</tr>
<tr>
<td>Economics</td>
<td>44</td>
</tr>
<tr>
<td>Electrical Engineering</td>
<td>3</td>
</tr>
<tr>
<td>Mathematics</td>
<td>4</td>
</tr>
<tr>
<td>Mechanical and Aerospace Engineering</td>
<td>3</td>
</tr>
<tr>
<td>Molecular Biology</td>
<td>2</td>
</tr>
<tr>
<td>Near Eastern Studies</td>
<td>1</td>
</tr>
<tr>
<td>Operations Research and Financial Engineering</td>
<td>21</td>
</tr>
<tr>
<td>Philosophy</td>
<td>2</td>
</tr>
<tr>
<td>Physics</td>
<td>3</td>
</tr>
<tr>
<td>Politics</td>
<td>3</td>
</tr>
<tr>
<td>Psychology</td>
<td>1</td>
</tr>
<tr>
<td>Woodrow Wilson School</td>
<td>4</td>
</tr>
</tbody>
</table>

**CLASS OF 2014**
Total expected number of certificates to be awarded: 100 (28 to women, or 28 percent)

<table>
<thead>
<tr>
<th>Major</th>
<th>Number of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Astrophysical Sciences</td>
<td>1</td>
</tr>
<tr>
<td>Chemical and Biological Engineering</td>
<td>4</td>
</tr>
<tr>
<td>Chemical and Electrical Engineering</td>
<td>1</td>
</tr>
<tr>
<td>Chemistry</td>
<td>2</td>
</tr>
<tr>
<td>Comparative Literature</td>
<td>1</td>
</tr>
<tr>
<td>Computer Science</td>
<td>10</td>
</tr>
<tr>
<td>Economics</td>
<td>40</td>
</tr>
<tr>
<td>Electrical Engineering</td>
<td>1</td>
</tr>
<tr>
<td>Mathematics</td>
<td>4</td>
</tr>
<tr>
<td>Mechanical and Aeronautical Engineering</td>
<td>1</td>
</tr>
<tr>
<td>Operations Research and Financial Engineering</td>
<td>24</td>
</tr>
<tr>
<td>Philosophy</td>
<td>1</td>
</tr>
<tr>
<td>Physics</td>
<td>2</td>
</tr>
<tr>
<td>Politics</td>
<td>1</td>
</tr>
<tr>
<td>Psychology</td>
<td>2</td>
</tr>
<tr>
<td>Woodrow Wilson School</td>
<td>5</td>
</tr>
</tbody>
</table>
DEPARTMENTAL PRIZES, HONORS, AND ATHLETIC AWARDS TO UCF 2011 STUDENTS

Undergraduate Certificate in Finance (UCF) students continue to receive a high proportion of the prizes awarded by their respective departments. This year, UCF students received a combination of departmental prizes and honors; 9 UCF seniors received 12 departmental prizes (two receiving two prizes) and one UCF junior received two departmental prizes; 15 UCF students were elected to Phi Beta Kappa Society; 22 UCF students were elected to membership in Society of Sigma Xi; 13 UCF students were elected to membership in Tau Beta Pi National Engineering Society; One senior (the only one in the Class of 2012) and 3 UCF juniors received the Shapiro Prize for Academic Excellence, 2010-2011; and 45 UCF students received academic honors (11 cum laude, 16 magna cum laude, and 18 summa cum laude). Thirty-two of our UCF students earned certificates in proficiency from 13 other departments or programs, 20 students earning one additional certificate, 11 earning 2 additional certificates and 1 earning three additional certificates.

15 UCF STUDENTS RECEIVED 15 DEPARTMENTAL PRIZES AND HONORS

Daniel Xiaochen Wang (MAT), Birch Family Prize (Bendheim Center for Finance)
Huija Wu (ECO), Kathleen Traynor ’83 Senior Research Prize (Bendheim Center for Finance)
Yang May Li (CBE), Richard K. Toner Thermodynamics Prize (Chemical and Biological Engineering)
Julia Yun Chien Yan (CHM), William Foster Memorial Prize in Chemistry (Chemistry)
Xiang Ding ’13 (ECO) and Taman Narayan ’13 (ECO), Junior Orator Medal (Debating and Public Speaking)
James Jiajun Luo (ECO), Wolf Balleisen Memorial Prize (Economics)
Huija Wu (ECO), Burton G. Malkiel ’64 Senior Thesis Prize in Finance (Economics)
James Jiajun Luo (ECO), Halbert White ’72 Prize in Economics (Economics)
Jonathan Richu Lin (ECO) and Matthew Ryan Wender (ECO), Daniel L. Rubinfeld ’67 Prize in Empirical Economics (ECO)
Ilina Mitra (ELE), Peter Mark Prize (Electrical Engineering)
Ilina Mitra (ELE), Lore von Jaskowsky Memorial Prize (School of Engineering and Applied Science)
Randi Louise Vogt (PSY), Francis LeMoyne Page Dance Award (Lewis Center for the Arts)
Steven Hsue Chen (ORF), Ahmet S. Cakmak Prize (Operations Research and Financial Engineering)
Bryton Ja-Shing Shang (ORF) and Benjamin Jun Yao (ORF), Dr. Frank S. Castellana Prize in Operations Research and Financial Engineering (Operations Research and Financial Engineering)
Ovidiu Alexandru Cotlet ’13 (PHY), Kusaka Memorial Prize in Physics (Physics)

1 UCF STUDENTS RECEIVED ATHLETIC AWARD

Michael John Monovoukas (WWS), The War Memorial Trophy (Swimming)
15 UCF STUDENTS WERE ELECTED TO PHI BETA KAPPA SOCIETY

Ahsan Barkatullah (ECO)  
Ka Wai Chan (ECO)  
Steven Chen (ORF)  
Amelia Chivetta (ORF)  
Daniel Condronimpuno (ORF)  
Ethan Goldstein (COS)  
Yu-Sung Huang (ORF)  
Jonathan Lin (ECO)

James Luo (ECO)  
Ilina Mitra (ELE)  
Harris Perlman (ORF)  
Daniel Xiaochen Wang (MAT)  
Matthew Wender (ECO)  
Huijia Wu (ECO)  
Benjamin Yao (ORF)

22 UCF STUDENTS WERE ELECTED TO MEMBERSHIP IN SOCIETY OF SIGMA XI

Steven Chen (ORF)  
Amelia Chivetta (ORF)  
Daniel Condronimpuno (ORF)  
Jack Gang (ORF)  
Anish Goel (ORF)  
Ethan Goldstein (COS)  
Sida Huang (ORF)  
Yu-Sung Huang (ORF)  
Andrew Kaier (COS)  
Shafiq Kashmiri (ORF)  
Yang May Li (CBE)

Lucy Lin (COS)  
Juan Mazzini (ORF)  
Iлина Mitra (ELE)  
Harris Perlman (ORF)  
Bryton Shang (ORF)  
Russell Slater (CHM)  
S Duane Stroebel III (ORF)  
Randi Vogt (PSY)  
Robert Weylandt Jr. (ECO)  
Chenyu Xu (ORF)  
Benjamin Yao (ORF)

13 UCF STUDENTS WERE ELECTED TO MEMBERSHIP IN TAU BETA PI NATIONAL ENGINEERING HONOR SOCIETY

Steven Chen (ORF)  
Amelia Chivetta (ORF)  
Daniel Condronimpuno (ORF)  
Jamie Ding (MAE)  
Ethan Goldstein (COS)  
Sida Huang (ORF)  
Yu-Sung Huang (ORF)  
Lucy Lin (COS)

Ilina Mitra (ELE)  
Bill Pang (ELE)  
Bryton Shang (ORF)  
Robert Weylandt Jr. (ECO)  
Chenyu Xu (ORF)  
Benjamin Yao (ORF)

1 UCF SENIOR RECEIVED THE SHAPIRO PRIZE FOR ACADEMIC EXCELLENCE 2010-2011

Bryton Shang (ORF)

3 UCF JUNIOR STUDENTS RECEIVED THE SHAPIRO PRIZE FOR ACADEMIC EXCELLENCE 2010-2011

William Minshew (ELE)  
Taman Narayan (ECO)  
Brian Tubergen (COS)
### SENIOR THESES AND INDEPENDENT PROJECTS OF THE CLASS OF 2012

This table shows the senior thesis and independent project titles from the UCF Class of 2012.

<table>
<thead>
<tr>
<th>Name</th>
<th>Field</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timothy Abbott</td>
<td>ECO</td>
<td>Can Algorithmic Trading Strategies Outperform Benchmark Indices? An Empirical Test of the Efficient Market Hypothesis</td>
</tr>
<tr>
<td>Ahsan Barkatullah</td>
<td>ECO</td>
<td>Credit Rating Agencies and Ratings Inflation</td>
</tr>
<tr>
<td>Kevin Baumler</td>
<td>ECO</td>
<td>Deconstructing the Wage Premium in the United States Investment Banking Industry</td>
</tr>
<tr>
<td>Ka Wai Chan</td>
<td>ECO</td>
<td>Macroeconomics of the Medium Run</td>
</tr>
<tr>
<td>Erica Che</td>
<td>ECO</td>
<td>Sustainability Sentiments: Evidence from Constituent Changes to the FTSE4Good</td>
</tr>
<tr>
<td>Steven Chen</td>
<td>ORF</td>
<td>Natural Gas Power Generation in the Presence of Wind: A Mixed Integer Linear Programming Approach to the Hour-Ahead Unit Commitment Problem</td>
</tr>
<tr>
<td>Yanran Chen</td>
<td>WWS</td>
<td>Politics over Property: Effects of the Housing Market on Presidential Approval and Public Opinion</td>
</tr>
<tr>
<td>Vijay Chetty</td>
<td>ECO</td>
<td>How Yesterday’s Merchants of Venice Led to Today’s Margins and Volatility: An Intermediation-Based Comparative Approach to the Leverage Cycle</td>
</tr>
<tr>
<td>Amelia Chivetta</td>
<td>ORF</td>
<td>Analyzing the Regional Greenhouse Gas Initiative: A Model of Carbon Dioxide Emissions in New Jersey</td>
</tr>
<tr>
<td>Daniel Condronimpuno</td>
<td>ORF</td>
<td>Leading Industries: Evidence from Emerging Markets and Application of Regime-Switching Investment Models</td>
</tr>
<tr>
<td>Chance Cross</td>
<td>ECO</td>
<td>A Ratings Roadblock: How the Issuer Pay Model Left Rating Agencies Unable to Properly Rate Debt</td>
</tr>
<tr>
<td>Jamie Ding</td>
<td>MAE</td>
<td>“Heterogeneous Beliefs, Short Sales Constraints and German Equity Returns Around Earnings Announcement Dates”</td>
</tr>
<tr>
<td>Maxwell Frost</td>
<td>ECO</td>
<td>An Empirical Analysis of the Liquidity and Tax Disadvantage of Tips and Their Effect on Treasury Borrowing Costs</td>
</tr>
<tr>
<td>Jack Gang</td>
<td>ORF</td>
<td>Applications of Recombining Stochastic Volatility Trees</td>
</tr>
<tr>
<td>Anish Goel</td>
<td>ORF</td>
<td>Too Big to Fail: A Market Study of the Banking Consolidation Phenomenon on Wall Street</td>
</tr>
<tr>
<td>Ethan Goldstein</td>
<td>COS</td>
<td>Playing in the Markets: A Reinforcement Learning Approach to Automated Market Making</td>
</tr>
<tr>
<td>Tiao Guan</td>
<td>ECO</td>
<td>Price Divergence Between Dual-listed A and H-shares: The Roles of Speculation, Market Liquidity, and Arbitrage</td>
</tr>
<tr>
<td>Ji Un Han</td>
<td>ECO</td>
<td>A Test of the Expectations Hypothesis of the Term Structure of Sovereign Credit Default Swaps: Is Sovereign Risk Premium Time-Varying?</td>
</tr>
<tr>
<td>Daniel Hong</td>
<td>PHI</td>
<td>An Examination of Firm Value and Leverage Under the Modigliani-Miller Propositions and Agency Theory</td>
</tr>
<tr>
<td>Nan Hu</td>
<td>ECO</td>
<td>Are You in or Are You Out: The Effect of Social Interaction on Household Market Participation in a Post-Crash Market</td>
</tr>
<tr>
<td>Quzhao Hu</td>
<td>ECO</td>
<td>Post-Acquisition Anomaly Revisited</td>
</tr>
<tr>
<td>Sida Huang</td>
<td>ORF</td>
<td>Future Prospects of OPEC and the Oil Market</td>
</tr>
<tr>
<td>Yu-Sung Huang</td>
<td>ORF</td>
<td>Dynamic Pricing of Electric Vehicle Charging Locations: An Application of Optimal Learning</td>
</tr>
<tr>
<td>Name</td>
<td>Program</td>
<td>Title</td>
</tr>
<tr>
<td>--------------------</td>
<td>---------</td>
<td>------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Andrew Kaier</td>
<td>COS</td>
<td>Weather to Buy or Sell: How Sunshine Changes Wall Street’s Performance</td>
</tr>
<tr>
<td>Kenichi Kaneko</td>
<td>ECO</td>
<td>Battle-Ready Behavior: Market Volatility and Corporate Finance Through the Financial Crisis</td>
</tr>
<tr>
<td>Shafiq Kashmiri</td>
<td>ORF</td>
<td>Online Portfolio Selection in U.S. and Emerging Markets Equities</td>
</tr>
<tr>
<td>Tyler King</td>
<td>ECO</td>
<td>Passenger Reaction Aboard a Sinking Ship: Market Response to the Events of the European Sovereign Debt Crisis</td>
</tr>
<tr>
<td>Laiyin Li</td>
<td>ECO</td>
<td>“Spillovers” from the Environment to Equities: Investor Sentiment from Oil Spills and U.S. Stock Performance</td>
</tr>
<tr>
<td>Yang Li</td>
<td>CHE</td>
<td>The Impact of the Global Financial Crisis on Momentum Profits in the Commodity Futures Market</td>
</tr>
<tr>
<td>Jonathan Lin</td>
<td>ECO</td>
<td>Internal Migration in the Great Recession: Trends, Determinants, and Returns</td>
</tr>
<tr>
<td>Lucy Lin</td>
<td>COS</td>
<td>Modeling Cascading Failures in Financial Networks</td>
</tr>
<tr>
<td>James Luo</td>
<td>ECO</td>
<td>Asset Pricing Implications of Information Asymmetries in Large Investor Networks</td>
</tr>
<tr>
<td>Trung Luong</td>
<td>ECO</td>
<td>Agricultural Commodity Futures: Evidence on Seasonality and Forecast Power</td>
</tr>
<tr>
<td>Jonathan Mattern</td>
<td>ECO</td>
<td>The Impact of High-Frequency Trading on Market Quality in Systematically Volatile Equity Markets</td>
</tr>
<tr>
<td>Juan Mazzini</td>
<td>ORF</td>
<td>Adding the Missing Player: The Effect of Including Consumers in the Oil Futures Market</td>
</tr>
<tr>
<td>Alexander Meyer</td>
<td>ENG</td>
<td>Online Payment Systems for the News Industry</td>
</tr>
<tr>
<td>Ilina Mitra</td>
<td>EEL</td>
<td>Do the Size Effect and Price-to-Book Effect Exist in India</td>
</tr>
<tr>
<td>Michael Monovoukas</td>
<td>WWS</td>
<td>Sovereign Debt: Levers Long Enough to Move the Earth</td>
</tr>
<tr>
<td>Xiaolei Mou</td>
<td>ECO</td>
<td>Rising Dragon and Crouching Peacock: A Comparative Event Study of Shareholder Value Effects of Cross-Border Acquisitions by China and India Firms &amp; Limitations of Event Study Method</td>
</tr>
<tr>
<td>Catherine O'Rourke</td>
<td>HIS</td>
<td>The House that Wald Built: An Examination of the Holistic Approach to Healthcare at Lillian D. Wald's Henry Street Settlement</td>
</tr>
<tr>
<td>Bill Pang</td>
<td>ELE</td>
<td>Building an Algorithmic Trading Platform &amp; Developing Automated Trading Algorithms</td>
</tr>
<tr>
<td>Tianyi Peng</td>
<td>ECO</td>
<td>The Application of a Four-Factor Asset-Pricing Model in the Chinese Stock Market</td>
</tr>
<tr>
<td>Harris Perlman</td>
<td>ORF</td>
<td>Imitating Masters: On Replicating the Investment Returns of Fine Art</td>
</tr>
<tr>
<td>Atanas Petkov</td>
<td>ECO</td>
<td>Understanding Catastrophe Bond Pricing: Empirical and Theoretical Approaches</td>
</tr>
<tr>
<td>Kunal Poddar</td>
<td>ECO</td>
<td>Bank-Dependent Versus Bond-Issuing Firms: An Analysis of Monetary Tightening in India</td>
</tr>
<tr>
<td>Shasanka Pradhan</td>
<td>ECO</td>
<td>Effect of Acquirers’ Venture Capital-Backing On Their Announcement Period Abnormal Returns</td>
</tr>
<tr>
<td>Alexander Pretko</td>
<td>ECO</td>
<td>An Analysis of RMB Valuation on the Yield of Dim Sum Bonds: Macroeconomic Factors and Evidence from the Non-Deliverable Forwards Market</td>
</tr>
<tr>
<td>Justin Rau</td>
<td>CHE</td>
<td>ISNetworld</td>
</tr>
<tr>
<td>Name</td>
<td>Degree</td>
<td>Department</td>
</tr>
<tr>
<td>--------------------</td>
<td>--------</td>
<td>------------</td>
</tr>
<tr>
<td>Karthik Ravi</td>
<td>ECO</td>
<td>Exploring the Effects of Sports Lockouts on Attendance in the NBA and NHL: Are Sports Substitute Goods?</td>
</tr>
<tr>
<td>Jonathan Samorajski</td>
<td>MAT</td>
<td>The Relative Performance of Equal-Weighted and Cap-Weighted Portfolios Across B Deciles</td>
</tr>
<tr>
<td>Carlos Sanchez</td>
<td>ECO</td>
<td>Executive Turnover and Firm Performance in Brazil: An Empirical Investigation</td>
</tr>
<tr>
<td>Bryton Shang</td>
<td>ORF</td>
<td>Analyzing, Modeling, &amp; Trading the NASDAQ Crosses</td>
</tr>
<tr>
<td>Steven Shonts</td>
<td>GEO</td>
<td>Financial Viability of Soil Carbon Sequestration in the Amazon: Opportunities and Challenges</td>
</tr>
<tr>
<td>Russell Slater</td>
<td>CHE</td>
<td>Sterling Biomedical, Inc</td>
</tr>
<tr>
<td>Shu Haur Tang</td>
<td>ECO</td>
<td>A Comparison of Bank Competition Indicators and their Relation to Financial Access</td>
</tr>
<tr>
<td>Benjamin Tsui</td>
<td>ECO</td>
<td>An Empirical Study of Return and Volatility Spillover Effects of Cross-Listed Companies across Hong Kong, Chinese, and US Markets</td>
</tr>
<tr>
<td>Randi Vogt</td>
<td>PSY</td>
<td>Understanding the Biases that Affect Investment Behavior and the Subsequent Market Outcomes</td>
</tr>
<tr>
<td>Lindsay von Clemm</td>
<td>ECO</td>
<td>A Macro Stress Testing Framework of Liquidity Risk in the Latin American Banking Sector</td>
</tr>
<tr>
<td>John Votta</td>
<td>ECO</td>
<td>Game of Trends: Institutional Ownership, Short Selling, and the Post-Earning Announcement Drift</td>
</tr>
<tr>
<td>Daniel Xiaochen Wang</td>
<td>MAT</td>
<td>Analytical Approaches to Calculating Value-at-Risk of a Quadratic Approximation of a Stock and Options Portfolio</td>
</tr>
<tr>
<td>Jack Wang</td>
<td>ORF</td>
<td>A Comparison of Methods of Pricing Spread Options in Markets with Transaction Costs</td>
</tr>
<tr>
<td>Jonathan Wang</td>
<td>ORF</td>
<td>Explaining Credit Default Swap</td>
</tr>
<tr>
<td>Matthew Wender</td>
<td>ECO</td>
<td>Hospice Ownership: The Impact of Profit Status on the Quality and Cost of End-of-Life Care in California</td>
</tr>
<tr>
<td>Robert Weylandt Jr.</td>
<td>ORF</td>
<td>Simulation Techniques for Bayesian Image Recovery in Lenz-Family Models</td>
</tr>
<tr>
<td>Huijia (Emily) Wu</td>
<td>ECO</td>
<td>Information Shocks and Bubble Crashes</td>
</tr>
<tr>
<td>Chenyu Xu</td>
<td>ORF</td>
<td>Grid Impacts of Charging Electric Vehicles in Urban Areas: A Case Study of Queens, NY</td>
</tr>
<tr>
<td>Benjamin Yao</td>
<td>ORF</td>
<td>Replication and Comparison of Commodity Futures Trading Strategies</td>
</tr>
<tr>
<td>Pearl Zhou</td>
<td>POL</td>
<td>To Get Rich is Glorious: The Politics of Stock Issuance in the Chinese Capital Market</td>
</tr>
</tbody>
</table>
MASTERS IN FINANCE
The distinctive feature of our Master in Finance program is its strong emphasis on financial economics in addition to financial engineering and computational methods. Graduates of our program have a solid understanding of the fundamental quantitative tools from economic theory, probability, statistics, optimization, and computer science, all of which are becoming increasingly vital in the financial industry.

To a greater degree than at any time in the past, there now exists a body of knowledge that is widely agreed to be essential for the proper analysis and management of financial securities, portfolios, and the financial decisions of firms. A driving force behind these developments is a lively exchange of ideas between academia and the financial industry, a collaboration that is the closest parallel in the social sciences to the academic-private sector interactions routinely seen in engineering and the applied sciences.

The Master in Finance program prepares students for a wide spectrum of careers in the financial industry, ranging from quantitative trading strategies, risk management, and financial engineering, to quantitative asset management and macroeconomic and financial forecasting. The program does not require prior work experience, although it can be a plus. The Bendheim Center for Finance provides extensive career assistance to students, including help with internships and job placement, through its own staff. Our placement record has been excellent.

The curriculum is designed to be completed in four terms. Admission letters will specify the expected program length. 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. This format allows exceptionally well-prepared students to complete the program in as little as one academic year. The program is designed to be completed on a full-time basis. Classes are taught during the day, and full-time students take four or five courses per term. Given the logistics, the only possibility for part-time enrollment would be for students who already work in the Princeton area and who would be able to attend class during the day. Part-time students are expected to take a minimum of two classes per term, and a maximum of four years (eight terms) to finish the program. All students are subject to an annual review of academic progress.

Princeton’s master’s 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 (a) the prerequisite skills in mathematics, economics, and probability and statistics necessary for the study of finance at a sophisticated level and (b) an integrated introduction to modern financial analysis. Second, a wide range of elective courses, drawn from many departments, will allow students to tailor the program to fit their own needs and interests. These courses will permit a range of opportunities for specialization and in-depth study of topics of interest to the student. Finally, the required summer internship is meant to provide additional practical experience in addressing real-world finance issues.
ADMISSION REQUIREMENTS

The Master in Finance program is designed both for students with training in mathematical or quantitative fields such as physics or engineering who want to make finance their main field of application, and for students with an economics or business background who want to acquire the quantitative skills essential for 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, which are pervasive in modern finance. An intensive two-week refresher course covering the relevant probability, statistics, and mathematics topics, as required for the core courses, is offered prior to the beginning of classes in the fall. In addition, we organize in September for every incoming class a three-day “boot camp” with industry professionals where various career options are reviewed and help is provided (including resume writing, one-on-one videotaped interview sessions, interviewing techniques, etc.).

Applicants must take either the GRE or the GMAT. Applicants whose native language is not English and who have not received their undergraduate education in the United States must take the TOEFL (Test of English as a Foreign Language) or the IELTS (International English Language Testing System) exam. Applicants whose native language is not English but who have received their undergraduate education in an English-speaking country do not have to submit these scores. Non-native English speakers who graduate with an undergraduate degree from an institution whose language of instruction is English but not in an English-language country must submit scores from either of these tests. All requirements are based on undergraduate education regardless of any graduate education. The Graduate School does not offer waivers of this requirement.
## STATISTICS ON THE ADMISSION PROCESS

### ADMISSION

<table>
<thead>
<tr>
<th>January '04</th>
<th>Applications</th>
<th>Offers</th>
<th>Acceptances</th>
</tr>
</thead>
<tbody>
<tr>
<td>200</td>
<td>19</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>January '05</td>
<td>296</td>
<td>31</td>
<td>19</td>
</tr>
<tr>
<td>January '06</td>
<td>418</td>
<td>47</td>
<td>27</td>
</tr>
<tr>
<td>January '07</td>
<td>425</td>
<td>49</td>
<td>32</td>
</tr>
<tr>
<td>January '08</td>
<td>660</td>
<td>40</td>
<td>30</td>
</tr>
<tr>
<td>January '09</td>
<td>591</td>
<td>24</td>
<td>19</td>
</tr>
<tr>
<td>January '10</td>
<td>601</td>
<td>31</td>
<td>25</td>
</tr>
<tr>
<td>January '11</td>
<td>729</td>
<td>36</td>
<td>29</td>
</tr>
<tr>
<td>January '12</td>
<td>815</td>
<td>48</td>
<td>43</td>
</tr>
</tbody>
</table>

### APPLICANT PROFILE: GENDER AND AGE

<table>
<thead>
<tr>
<th>January '04</th>
<th>Female</th>
<th>Male</th>
<th>Median Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>29%</td>
<td>71%</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>January '05</td>
<td>26%</td>
<td>74%</td>
<td>26</td>
</tr>
<tr>
<td>January '06</td>
<td>29%</td>
<td>71%</td>
<td>25</td>
</tr>
<tr>
<td>January '07</td>
<td>31%</td>
<td>69%</td>
<td>23</td>
</tr>
<tr>
<td>January '08</td>
<td>31%</td>
<td>69%</td>
<td>24</td>
</tr>
<tr>
<td>January '09</td>
<td>36%</td>
<td>64%</td>
<td>24</td>
</tr>
<tr>
<td>January '10</td>
<td>39%</td>
<td>61%</td>
<td>24</td>
</tr>
<tr>
<td>January '11</td>
<td>38%</td>
<td>62%</td>
<td>25</td>
</tr>
<tr>
<td>January '12</td>
<td>38%</td>
<td>62%</td>
<td>24</td>
</tr>
</tbody>
</table>

### HIGHEST DEGREE BEFORE APPLYING TO PRINCETON’S M.FIN.

<table>
<thead>
<tr>
<th>January '04</th>
<th>Bachelor</th>
<th>Master</th>
<th>Ph.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>85%</td>
<td>14%</td>
<td>1%</td>
<td></td>
</tr>
<tr>
<td>January '05</td>
<td>60%</td>
<td>35%</td>
<td>5%</td>
</tr>
<tr>
<td>January '06</td>
<td>66%</td>
<td>30%</td>
<td>4%</td>
</tr>
<tr>
<td>January '07</td>
<td>68%</td>
<td>28%</td>
<td>4%</td>
</tr>
<tr>
<td>January '08</td>
<td>72%</td>
<td>26%</td>
<td>2%</td>
</tr>
<tr>
<td>January '09</td>
<td>75%</td>
<td>23%</td>
<td>2%</td>
</tr>
<tr>
<td>January '10</td>
<td>8%</td>
<td>20%</td>
<td>2%</td>
</tr>
<tr>
<td>January '11</td>
<td>78%</td>
<td>20%</td>
<td>2%</td>
</tr>
<tr>
<td>January '12</td>
<td>83%</td>
<td>15%</td>
<td>2%</td>
</tr>
</tbody>
</table>

### APPLICANT PROFILE: GRE SCORES MEAN (MEDIAN)

<table>
<thead>
<tr>
<th>January '04</th>
<th>Analytical</th>
<th>Quantitative</th>
<th>Verbal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applicants</td>
<td>714 (810)</td>
<td>776 (790)</td>
<td>554 (560)</td>
</tr>
<tr>
<td>September '04</td>
<td>Entering Class</td>
<td>768 (780)</td>
<td>786 (800)</td>
</tr>
<tr>
<td>January '05</td>
<td>Advocates</td>
<td>705 (745)</td>
<td>781 (800)</td>
</tr>
<tr>
<td>September '05</td>
<td>Entering Class</td>
<td>765 (765)</td>
<td>789 (800)</td>
</tr>
<tr>
<td>January '06</td>
<td>Applicants (new test)</td>
<td>4.47 (4.5)</td>
<td>781 (800)</td>
</tr>
<tr>
<td>September '06</td>
<td>Entering Class (new test)</td>
<td>5.1 (5)</td>
<td>786.5 (800)</td>
</tr>
<tr>
<td>January '07</td>
<td>Applicants</td>
<td>4.44 (4.5)</td>
<td>786.77 (800)</td>
</tr>
<tr>
<td>September '07</td>
<td>Entering Class</td>
<td>4.75 (5)</td>
<td>795.39 (800)</td>
</tr>
<tr>
<td>January '08</td>
<td>Applicants</td>
<td>4.18 (4)</td>
<td>786.43 (800)</td>
</tr>
<tr>
<td>September '08</td>
<td>Entering Class</td>
<td>4.67 (5)</td>
<td>788.43 (800)</td>
</tr>
<tr>
<td>January '09</td>
<td>Applicants</td>
<td>4.17 (4)</td>
<td>787.19 (800)</td>
</tr>
<tr>
<td>September '09</td>
<td>Entering Class</td>
<td>4.58 (4.5)</td>
<td>795.74 (800)</td>
</tr>
<tr>
<td>January '10</td>
<td>Applicants</td>
<td>4.01 (4)</td>
<td>788.34 (800)</td>
</tr>
<tr>
<td>September '10</td>
<td>Entering Class</td>
<td>4.42 (4.5)</td>
<td>798.95 (800)</td>
</tr>
<tr>
<td>January '11</td>
<td>Applicants</td>
<td>3.84 (4)</td>
<td>91 (800)</td>
</tr>
<tr>
<td>September '11</td>
<td>Entering Class</td>
<td>4.48 (4.5)</td>
<td>796.8 (800)</td>
</tr>
<tr>
<td>January '12</td>
<td>Applicants (new scale)</td>
<td>3.79 (40%)</td>
<td>165.3 (93%)</td>
</tr>
<tr>
<td>September '12</td>
<td>Entering Class (new scale)</td>
<td>4.6 (71%)</td>
<td>165.3 (93%)</td>
</tr>
</tbody>
</table>
PROGRAM REQUIREMENTS

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

- At least five of the elective courses must be at the level 500 or higher.
- At least five of the elective courses must be taken from List 1 below.
- 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 for Finance-affiliated faculty member on a topic relevant to finance, and by enrolling in the appropriate courses (FIN 560/561), they can receive academic credit equivalent to one or two elective courses (thereby reducing the number of required electives).

CORE COURSES

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

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

ELECTIVE COURSES

In addition to core courses, which provide a broad survey of topics and techniques of modern finance, the program offers 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 515: Portfolio Theory and Asset Management | FIN 591: Cases in Financial Risk Management |
| FIN 516: Topics in Corporate Finance, Corporate Governance, and Banking | FIN 592: The Rise of Asian Capital Markets |
| FIN 517: Venture Capital and Private Equity Investment | FIN 593: Financial Crises |
| FIN 518: International Financial Markets | ECO 414: Introduction to Economic Dynamics |
| FIN 519: Corporate Restructuring, Mergers, and Acquisitions | ECO 525/FIN 595: Financial Economics I |
| FIN 522: Options, Futures, and Financial Derivatives | ECO 575/FIN 575: Topics in Financial Economics |
| FIN 523: Forecasting and Time Series Analysis | ORF 527: Stochastic Calculus and Finance |
| FIN 560: Master’s Project I | ORF 530: Statistical Analysis of Large Financial Datasets |
| FIN 561: Master’s Project II | ORF 531/FIN 531: Computational Finance in C++ |
| FIN 570: Valuation and Security Analysis | ORF 538: Analytical and Computational Methods of Financial Engineering |
| FIN 590: Financial Accounting | ORF 555: Fixed Income Models |
| FIN 591: Cases in Financial Risk Management | ORF 569: Special Topics in Statistics and Operations Research |
| FIN 592: The Rise of Asian Capital Markets | ORF 574: Special Topics in Investment Science |
LIST 2: GENERAL METHODOLOGY FOR FINANCE

APC 350: Introduction to Differential Equations
APC 503: Analytical Techniques in Differential
Equations
APC 518/ORF 518: Applied Stochastic Analysis
and Methods
CEE 513: Introduction to Finite-element Methods
CEE 532: Advanced Finite-element Methods
CEE 548: Risk Assessment and Management
CHE 508: Numerical Methods for Engineers
CHE 530: Systems Engineering
COS 318: Operating Systems
COS 323: Computing for the Physical and Social
Sciences
COS 333: Advanced Programming Techniques
COS 423: Theory of Algorithms
COS 424: Interacting with Data
COS 425: Database Systems
COS 432: Information Security
COS 436: Human-computer Interface Technology
COS 444/ECO 444: Electronic Auctions
COS 461: Computer Networks
ECO 418: Strategy and Information
ECO 501: Microeconomic Theory I
ECO 502: Microeconomic Theory II
ECO 503: Macroeconomic Theory I
ECO 504: Macroeconomic Theory II
ECO 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: Advanced Econometrics: Nonlinear
Models
ECO 521: Advanced Macroeconomic Theory I
ECO 522: Advanced Macroeconomic Theory II
ECO 523: Public Finance I
ECO 524: Public Finance II
ECO 531: Economics of Labor
ECO 541: Industrial Organization and Public
Policy
ECO 551: International Trade I
ECO 552: International Trade II
ECO 553: International Monetary Theory and
Policy I
ECO 554: International Monetary Theory and
Policy II
ELE 591: High-tech Entrepreneurship
MAE 503: Basic Numerical Methods for Ordinary
and Partial Differential Equations
MAT 301/MAE 305: Mathematics in Engineering
I (ODE, PDE)
MAT 302/MAE 306: Mathematics in
Engineering II
MAT 305: Mathematical Programming
MAT 591 & MAT 592: Applied Partial Differential
Equations
MAT 594/APC 584 Wavelets: Applications of
Wavelets in Mathematics and Other Fields
ORF 307: Optimization
ORF 311: Optimization under Uncertainty
ORF 401: Electronic Commerce
ORF 474: Special Topics in Operations Research
and Financial Engineering
ORF 522: Linear Optimization
ORF 523: Nonlinear Optimization
ORF 524: Statistical Theory and Methods
ORF 526: Probability Theory
ORF 533: Convex Analysis for Mathematical
Finance
ORF 542: Stochastic Control and Stochastic
Differential Games
ORF 547: Dynamic Programming
ORF 548: Large-scale Optimization
ORF 549: Stochastic Programming
ORF 551: Probability Theory
ORF 553: Stochastic Differential Equations
ORF 554: Markov Processes
TRACKS

Elective courses can be chosen according to either individual needs and preferences, or to conform to one of the suggested tracks, listed below. It is not necessary for a student to designate or complete a particular track to satisfy the master’s requirements; the tracks listed below are merely illustrations of coherent courses of study that students might choose. Beyond the tracks listed below, we offer a number of electives in corporate finance, dealing with the choice and financing of investment projects, firms’ determination of dividend policy, optimal capital structure, financial reorganization, mergers and acquisitions, start-up financing, deal structure, incentive design, valuation of high-risk projects, initial public offerings, etc. However, we believe that our students’ comparative advantage often 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, and it 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 macroeconomic models.
FINANCIAL TECHNOLOGIES

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

SEMINARS AND COMPUTING ENVIRONMENT

Students are involved in regular seminars offered by academic researchers and industry representatives, and they will have the opportunity to participate in collaborative projects in some of the elective courses. The Financial Engineering Laboratory (equipped with financial data feeds, personal computers, and 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 finance in C++.
SELECT COURSE DESCRIPTIONS

ECO 362: Financial Investments
This course surveys the field of investments with special emphasis on the valuation of financial assets. Issues studied include how portfolios of assets should be formed, how to measure and control risk, how to evaluate investment performance, and how to test alternative investment strategies and asset pricing models.

FIN 501: Asset Pricing I: Pricing Models and Derivatives
This course provides an introduction to the modern theory of asset pricing. Topics include: no arbitrage, Arrow-Debreu prices and equivalent martingale measures, security structure and market completeness, mean-variance analysis, Beta-pricing, CAPM, and introduction to derivative pricing.

FIN 502: Corporate Finance and Financial Accounting
This course 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 with the skills necessary to become informed users of financial statements. Problem sets emphasize an ability to interpret and analyze financial statement disclosures.

FIN 502: Introduction to the Modern Theory of Asset Pricing
This course provides an introduction to the modern theory of asset pricing. Topics include: no arbitrage, Arrow-Debreu prices and equivalent martingale measures, security structure and market completeness, mean-variance analysis, Beta-pricing, CAPM, and introduction to derivative pricing.

FIN 515: Portfolio Theory and Asset Management
This course covers a number of advanced topics related to asset management and asset pricing, including 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: 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 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; and (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 the trading strategies associated with financial derivatives for different purposes and potential problems that can arise in the application of financial derivatives. This course is technical by nature and requires extensive use of calculus, statistics, and Excel spreadsheet programming.

FIN 560/561: Master’s Project I and II
Under the direction of a Bendheim Center for Finance-affiliated faculty member, students carry out a master’s project and write a report.
FIN 567: Institutional Finance, Trading, and Markets
This course studies financial institutions and focuses on the stability of the financial system. It covers important theoretical concepts and recent developments in financial intermediation, asset pricing under asymmetric information, behavioral finance and market microstructure. Topics include market efficiency, asset price bubbles, herding, liquidity crisis, risk management, market design, and financial regulation.

FIN 568: Behavioral Finance
This course will present models that are psychologically more realistic than the standard “rational actor” model. About 30 percent of the course will be devoted to economics, 70 percent to finance. Applications to economics will include decision theory, happiness, fairness, and neuroeconomics. Applications to finance will include theory and evidence on investor psychology, predictability of the stock market and other markets, limits to arbitrage, bubbles and crashes, experimental finance, and behavioral corporate finance.

FIN 570: Valuation and Security Analysis
This is a specialized corporate finance course. The objective is to teach valuation methods. The course uses accounting and finance concepts for valuing firms and covers the necessary corporate finance concepts with an equal mix of theory and application. Topics include financial statement analysis, capital budgeting methods, estimating cash flows, estimating various costs of capital, valuation of projects, valuation of companies and security valuation, LBOs, mergers and acquisitions, valuing a drug licensing opportunity, the initial public offering valuation, and valuation of strategic and real options.

FIN 590: Financial Accounting
A survey of the concepts and techniques that non-managers use to hold the managers of organized human activity—chiefly corporations—accountable for the resources entrusted to them. Alerts students to the judgments and assumptions that regulators and managers make in that process, even when the managers wish to report honestly. Explores the methods that the managers of resources can (and often do) use to lie about their actual performance. While this course aims to make you a sophisticated user, not producer, of financial statements, you must master some record keeping procedures and vocabulary in order to be the boss, not the servant.

FIN 591: Cases in Financial Risk Management
This course examines the concept of risk and its mitigation, and how the ideas can be applied in the practice of risk management for financial and non-financial companies. The basic toolkit draws on economics, probability theory, and statistics, and they are integrated with more advanced concepts drawn from portfolio choice, derivative securities, and dynamic hedging. The overall aim of the course is to demonstrate how the main concepts have practical applications.

FIN 592: The Rise of Asian Capital Markets
This course explores the increasing weight of Asia in global equity financial markets and its implications, and frames the discussion in the macroeconomic context of the globalization of financial markets and the evolution of the global monetary system. The course puts particular emphasis on concepts of economic development, market efficiency, and corporate governance. Discussions combine analysis of historical trends and recent data and events with insights from practical experience in Asian equity markets. The course also explicitly considers the policy decisions faced by the U.S. and Chinese governments relative to existing global imbalances.

FIN 593: Financial Crises
This course uses economic theory and empirical evidence to study the causes of financial crises and the effectiveness of policy responses to them. Particular attention is given to some of the major economic and financial crises of the past century and to the crisis that began in August 2007.

ECO 525/FIN 595: Financial Economics I
This course covers asset pricing in competitive markets in which traders have homogeneous information. Empirical tests of asset-pricing models and associated “anomalies” are also surveyed. Measures of riskiness and risk aversion, intertemporal asset-pricing models, dynamic portfolio choice, option pricing and the term structure of interest rates, corporate investment and financing decisions, and taxation are studied.

ECO 526/FIN 596: Financial Economics II
This course studies 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.
ECO 575/FIN 575: Topics in Financial Economics
This course is intended for Ph.D. students who have already completed the yearlong Ph.D. sequence in finance (ECO 525 and 526) and who intend to write their dissertation in finance. Topics vary by year, focusing on recent developments in the field.

ORF 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 505/FIN 505: Modern Regression and Time Series
This course examines linear and mixed effect models, nonlinear regression, nonparametric regression and classification, time series analysis, stationarity and classical linear models (AR, MA, ARMA), nonlinear and nonstationary time-series models, state space systems, and hidden Markov models and filtering.

ORF 515/FIN 503: Asset Pricing II: Stochastic Calculus and Advanced Derivatives
This course begins with an overview of basic probability theory and covers the elements of stochastic calculus and stochastic differential equations that are widely used in derivatives modeling, pricing, and hedging. Topics include Brownian motion, martingales, and diffusions and their uses in stochastic volatility; volatility smiles; risk management; interest-rate models; and derivatives, swaps, credit risk, and real options.

ORF 531/FIN 531: Computational Finance in C++
The intent of this course is to introduce the student to the technical and algorithmic aspects of a wide spectrum of computer applications currently used in the financial industry, and to prepare the student for the development of new applications. The student will be introduced to C++, the weekly homework will involve writing C++ code, and the final project will also involve programming in the same environment.

ORF 534/FIN 534: Financial Engineering
This course surveys central topics in the area of financial engineering and multi-period financial planning systems. It covers pricing methodologies integrated with financial planning systems and linking asset and liability strategies to maximize surplus wealth over time. We model the organization as a multi-stage stochastic program with decision strategies.

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

ORF 538: Analytical and Computational Methods for Financial Engineering
This course introduces analytical and computational methods that are common in financial engineering problems. It is aimed at Ph.D. students and advanced M.A. students who have studied stochastic calculus. The focus is on uses of partial differential equations: their appearance in pricing financial derivatives, connection with Markov processes, and occurrence as Hamilton-Jacobi-Bellman equations in stochastic control problems, and analytical, asymptotic, and numerical techniques for their solution.

ORF 555/FIN 555: Fixed Income Models
This course is an 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, and risk of default.
MASTER IN FINANCE PLACEMENT

Our program has continued to enjoy excellent success with 95 percent of our 2012 graduates being placed in finance industry jobs and 100 percent internship placement. The candidates for the Master in Finance receive support and assistance with their postgraduate career planning from a coordinated program of resources, including Princeton’s Office of Career Services and the Bendheim Center for Finance’s director of corporate relations. They also benefit from support from our Corporate Affiliates Program and Advisory Council.

OUR GRADUATES WILL BE PURSUING THEIR CAREERS AT:

Akuna Capital, Chicago
Barclays Capital Market Risk, New York
Bridgewater Associates, Westport, CT
Cerberus Private Equity, New York
Citadel Investments, Chicago
Citi Market Quantitative Analysis
Credit Suisse Sales & Trading, Hong Kong
Credit Suisse Fixed Income Sales & Trading, London
Eladian Trading, New York
Goldman Sachs Securities, New York
Goldman Sachs Strats, Securities, London
Goldman Sachs Securities, Hong Kong
KAUST Endowment Management, Washington, DC
Monetary Authority of Singapore
Morgan Stanley Market Risk, New York
Singaporean Government
Sun Trading LLC, Chicago

OUR FIRST-YEAR STUDENTS HAVE OBTAINED SUMMER INTERNSHIPS AT:

Acadian Asset Management, Boston
Bank of Japan, New York
BONY Mellon Structured Products, New York
Credit Suisse Fixed Income Sales & Trading, New York
Goldman Sachs Sales and Trading, New York
Hedge fund, New York
JPMorgan FX Strategy, New York
JPMorgan Sales & Trading, Hong Kong
JPMorgan Sales and Trading, Singapore
JPMorgan Sales and Trading/Quant Research, New York
Korean Hedge Fund
Morgan Stanley Sales & Trading, New York
New York Federal Reserve - Credit Group
Sungard Risk Management, New York
Susquehanna International Group, Philadelphia
Track Research, New York

FELLOWSHIPS AWARDED:

The Gerhard R. Andlinger ’52 Graduate Fellowship in Finance was awarded to Yijie (Sissi) Chen (University of Toronto).

The Bendheim Graduate Fellowships in Finance were awarded to Michael Kraus (Georgia Institute of Technology), Chihiro Seko (University of Tokyo), and Qiong (Franklin) Wang (Peking University).
MF MATH CAMP/BOOT CAMP

For the seventh year, the Bendheim Center for Finance conducted a two-week “math camp” program, August 29–September 9, taught by Matt Lorig. The purpose of the math camp is to enrich the finance mathematics background of the incoming students so that they are ready for the mathematical rigors of the program.

Following math camp, we continued our three-day “boot camp” program, which was developed for the incoming students prior to the beginning of classes in September. The camp focuses on a refresher of various finance topics, the types of careers for which the Master in Finance degree prepares students, and some useful information on interviewing and networking skills. Boot camp presenters included the Bendheim Center for Finance faculty, Master in Finance alumni, and speakers from the financial services industry. This program was well received by the incoming students, particularly those who would have to begin interviewing for permanent jobs less than six weeks after starting the program. In 2011, the program’s agenda was as follows:

SATURDAY, SEPTEMBER 10
Panel Discussion among Recent Graduates on Careers in Finance and Job Search Best Practices—Nicolas Cojocaru-Durand, Citadel; Theo Kim, Princeton University Investment Company; Adam Lichtenstein, Kepos Capital; Nestor Macias, Credit Suisse, Chad Shampine, Morgan Stanley; and Dennis Walsh, Goldman Sachs Asset Management.
Mock Interviews with Roundtable Participants.

MONDAY, SEPTEMBER 12
Portfolio Management—John D. Naud, Senior Portfolio Manager, Global Rates, Citadel Morgan Stanley Strats Group—Eric Pan and Pankaj Khandelwal Princeton Investment Company—Andy Golden, President Leveraged Finance Sales/Global Credit Products—Amy Emanuel, Managing Director, Credit Suisse Kohlberg Kravis Roberts & Co.—John Massad, Director, and Antoine Chiche, Principal

TUESDAY, SEPTEMBER 13
Citi Markets Quantitative Analysis—Arnold Miyamoto, Managing Director, Global Head, Markets Quantitative Analysis Economics and Finance Library—Todd Hines Career Services Resources—Amy L. Pszczolowski and Julie Shurts Careers Landscape from an Employer View—Chris Resto and Ann Guo, GETCO Perspectives from a Global Career—Peter Lighte, JPMorgan, Vice Chairman, Global Corporate Bank, China Equity Research, Nomura Securities—Brian Foran, Managing Director and Senior Analyst, Banking Sector Risk Management—Ji Park, Barclays Capital Goldman Sachs Strats: Paul Walker, Partner and Managing Director, Global Head of Core Strats
MFIN WEEKLY LUNCH AND LEARNS

In addition to boot camp, a number of guest speakers from a variety of areas of finance visited the Bendheim Center in 2011/2012 to address Master in Finance, undergraduate, and PhD students.

Steven Mayer ’81, Cerberus Capital Management—Sept 23, 30, Oct. 14
Kenneth Hersh, CEO and Co-Founder, NGP Energy Capital Management,—Sept 26
Credit Suisse Sales and Trading and Investment Banking—Oct 5, 12
Mark Higgins (MD) and Anil Bangia (ED) of JPMorgan Quantitative Research—Oct. 11
Robert Khoury ’90, World Wide Financial Industry Recruiting—Oct. 18
Carl Riccadonna ’01, Senior US Economist, Deutsche Bank—Oct. 20
Harold Kim PhD ’93, MD, Citi Hong Kong—Nov. 14
Alan DeRose ’83, MD, Oppenheimer—Dec. 1
Eric Taylor, Citadel Recruiting—Dec. 6
Josh Dunn and Aaron Katz, Edgestream Partners—Dec. 13
Robert Eaton, MD, BlackRock—Dec 13
Princeton Quant Trading Conference (various speakers)—March 31
Lito Camacho, Credit Suisse Vice Chairman, Asia Pacific; CEO, Singapore—April 16
Jay Powell, Bipartisan Policy Institute—May 3
John Porter, Barclays Capital, MD, Global Strategic Bank Portfolio—May 9
ADVISORY COUNCIL AND SUPPORTERS
ADVISORY COUNCIL

The Advisory Council for the Bendheim Center for Finance is made up of a group of distinguished leaders in the financial industry. The council meets on campus once a year. In 2012, the meeting took place on May 3-4. We continued our format of including a dinner the night before the morning meeting to enable the council members to exchange ideas in a more informal setting.

COUNCIL MEMBERS

Hamid Biglari  
Vice Chairman  
Citicorp

John C. Bogle  
President  
Bogle Financial Markets Research Center  
Vanguard

Richard H. Bott  
Vice Chairman (retired)  
Morgan Stanley Investment Banking Division

John L. Cecil  
Chairman and Chief Executive Officer  
Eagle Knolls Capital

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

Howard E. Cox Jr.  
General Partner  
Greylock Management Corporation

David A. DeNunzio  
Vice Chairman, Mergers and Acquisitions  
Crédit Suisse

Jeremy Diamond  
Managing Director  
Annaly Capital Management, Inc.

J. Michael Evans  
Vice Chairman  
Goldman, Sachs & Co.

Arminio Fraga  
Chairman and Chief Investment Officer  
Gavea Investimentos

John K. Hepburn  
Advisory Vice Chairman  
Morgan Stanley & Co.

Kenneth Hersh  
Chief Executive Officer  
NGP Energy Capital Management

William H. Heyman  
Vice Chairman and Chief Investment Officer  
The Travelers Companies, Inc.

Alfred F. Hurley Jr.  
Vice Chairman  
Emigrant Bank

William H. Janeway  
Senior Adviser  
Warburg Pincus

Hugh E. McGee III  
Head of Global Investment Banking  
Barclays Capital

Heidi G. Miller  
Former President, International  
JPMorgan Chase

Jeffrey M. Peek (Chair)  
Vice Chairman, Investment Banking  
Barclays Capital, Inc.

Lynn Bendheim Thoman  
Co-president  
Leon Lowenstein Foundation
CORPORATE AFFILIATES PROGRAM

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

2012 AFFILIATES

AXA Equitable  
Barclays Capital  
Citadel Investments Group  
Citigroup  
Crédit Suisse  
DC Energy  
Deutsche Bank  
Edelman & Associates  
Goldman Sachs  
Prediction Company, LLC (subsidiary of UBS)

- Annual Report of the Bendheim Center for Finance
- Opportunity to advertise internships and employment opportunities to both Undergraduate Certificate in Finance and Master in Finance students
- Opportunity to use the Bendheim Center for Finance facilities to host recruiting events
- Access to the Bendheim Center for Finance director of corporate relations as a resource for recruiting
- Recognition in the publicly disseminated materials of the Bendheim Center for Finance, including the center’s reports and website, which both list corporate affiliates, as well as a hyperlink to each member’s website
- Access to research authored by the center’s affiliated faculty within the academic year
- Access to Bendheim Center for Finance faculty for internal or client presentations or for sponsored research
- Opportunity to work with the center’s 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 Bendheim Center for Finance-sponsored conferences
- Invitation and two reserved seats for all public events hosted by the center
GIFT OPPORTUNITIES

Early in 1998, a $10 million gift from the Leon 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 Bendheim Center for Finance 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.

ACADEMIC PERSONNEL

Endowed Professorships (five committed, two additional needed)
*To support the appointment of a distinguished senior faculty member*
$4,000,000

Endowed Visiting Professorship (one needed)
*To support a distinguished senior visitor who provides expertise in a particular area of study*
$2,000,000

Postdoctoral Fellows (one needed)
$1,500,000

Junior Faculty Fellow (one committed, one additional needed)
$1,500,000

FELLOWSHIPS

Graduate Fellowships (three committed, seven additional needed)
*To support a new generation of scholars concentrating in finance*
$250,000

SUPPORT OF FINANCIAL RESEARCH AND TEACHING

Research and Course Development Funds
*Endowed funds to support research and course development*
$50,000 minimum

PHYSICAL SPACE

Director's Office
$100,000

Graduate Student Suite
$100,000
ACKNOWLEDGMENTS 2011-12

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

INDIVIDUAL SPONSORS

Gerhard R. Andlinger ’52
Kwesi Adofo-Mensah ’03
Chester Baylis Jr. ’29 (D)
Robert M. Baylis ’60
Robert Bendheim ’37 (D)
Hamid Biglari *87
David H. Blair ’67
Charles Brodbeck ’71
David Carlin ’60
Howard E. Cox Jr. ’64
David A. DeNunzio ’78
Kathleen T. DeRose ’83
Jay Diamond ’86 and
Alexandra Lebenthal ’86
The Family of Carl H. Donner ’20
J. Michael Evans ’80
Edward B. Goodnow ’47
Mr. and Mrs. Randall A. Hack ’69
Walter Haydock ’75
John K. Hepburn ’72
Robert R. Hermann Jr. ’75
Kenneth Hersh Jr. ’85
William H. Heyman ’70
Alfred F. Hurley Jr. ’70
Stanley G. Ivins W34
William H. Janeway ’65
Richard Korhammer ’88
Oliver M. Langenberg ’35
Susan Payne Madole ’76
Edward E. Matthews ’53
John Mayer ’62
Reuben M. Morriss III ’58 (D)
Sharmin Mossavar-Rahmani ’80
Robert B. Payne Jr. ’74
Robert B. Payne Sr. ’45
Jeffrey M. Peek ’69
John G. Quigley
Jonathan F. Schachter PhD ’94
John H. Scully ’66
Lynn Bendheim Thoman ’77
Dario Villani *02
Evan A. Wyly ’84
Mr. and Mrs. Paul M. Wythes ’55
William T. Young Jr. ’70

GROUPS/ORGANIZATIONS

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