

Economics at MIT

2004-2005



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Department of Economics

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Recent Developments

THE 2003-2004 ACADEMIC YEAR began with a change in leadership for the MIT Economics Department, as Bengt Holmström succeeded Olivier Blanchard as department head. Bengt is an expert on the economics of incentives and organization. James Poterba, who was associate department head under Olivier Blanchard, continues in that role. Olivier Blanchard, who served as department head for five years, spent much of the year as a Fellow at the Russell Sage Foundation in New York City.

The past year was marked by moments of celebration, as well as moments of sadness. One of the celebratory moments was the inauguration of the Charles P. Kindleberger Professorship in Applied Economics. This is the result of a generous gift from one of Charlie's former students, Dr. C.C. Chen, who is profiled on page seven. Charlie, who passed away July 2003, had a very distinguished, and remarkably varied, career. Besides his academic accomplishments as a scholar of international economics and economic history, he served in an important role in the economics division of military intelligence in World War II. He was also one of the designers of the Marshall plan to rebuild Europe after the war. He was an MIT faculty member for more than five decades. Daron Acemoglu is the first holder of the Kindleberger Professorship. His research on the determinants of long-term economic growth, particularly on the role of technological change and on the influence of political economy factors, follows in the tradition of Charlie's work.

The department also added another new faculty chair this year: the Rudi Dornbusch Career Development Chair. This chair, which was funded by gifts from many of Rudi's former students and friends in the academic community, will be used to support a junior faculty member who is pursuing promising new research. It provides a lasting tribute to Rudi's enormous intellectual and collegial contributions to the MIT Economics Department, to the economics profession, and to the global economic policy community. The first holder of the Dornbusch Chair will be Xavier Gabaix. His research explores issues in financial economics, macroeconomics, and behavioral economics.

One of the year's saddest moments was the passing of Franco Modigliani. Franco died in October, energetic to the end, and left behind an unfinished new paper on the market valuation of debt and equity securities as well as many other projects. The MIT Economics community gathered for a memorial service in early December. Undeterred by an early season blizzard, several hundred former students, colleagues, and other associates gathered at Kresge Auditorium to recall the many ways in which Franco had touched their lives and contributed to the advancement of economic science and economic policy making.

The Economics Department hired two new assistant professors this year: Mikhail Golosov and Guido Lorenzoni. Mikhail received his Ph.D. from the University of Minnesota, with a specialization in macroeconomics and public finance. He will be teaching courses in both fields next year. Guido is an MIT economics graduate who is returning to the department after three years at Princeton. He will be teaching international economics and macroeconomics.

Frank Fisher, who introduced several generations of MIT graduate students to economic theory, econometrics, and mathematics for economists, retired at the end of the academic year. Frank plans to remain actively involved with the department, and he is continuing a major research project on the econom-



Franco MODIGLIANI
(1918-2003)

ics of water use in the Middle East. Whitney Newey, who has made wide-ranging contributions in designing econometric tools for the analysis of household and firm data, has succeeded Frank as the holder of the Jane Berkowitz Carlton and Dennis William Carlton Professorship in Microeconomics.

Victor Chernozhukov, whose research also focuses on the development of new econometric methods, has been appointed to the Castle Krob Career Development Chair in Economics. Two faculty members left MIT this year, Guido Kuersteiner for Boston University and Sendhil Mullainathan for Harvard.

The MIT Economics faculty collected a number of honors and awards during the past year. Daron Acemoglu was the first recipient of the Sherwin Rosen Prize in labor economics. He also gave the Lionel Robbins Memorial Lectures at the LSE. Abhijit Banerjee was elected to the American Academy of Arts and Sciences and gave the Kuznets lectures at Yale. Olivier Blanchard received an honorary doctorate from the Université de Québec and gave the IDEI lecture in Toulouse. Ricardo Caballero gave the Mitsui-MIRI lecture in Tokyo. Whitney Newey became one of the co-editors of *Econometrica*. James Poterba gave the Munich Lectures. Nancy Rose received a Guggenheim Fellowship.

The MIT Economics Department's distinguished alumni regularly receive important academic honors and participate in the highest levels of policy making. In January, Steven Levitt, a 1994 Ph.D. graduate, received the John Bates Clark Medal from the American Economics Association. This award is presented every other year to an economist under the age of forty who has made outstanding contributions to economic science. With regard to policy making, two of the three members of the U.S. Council of Economic Advisors (CEA) are MIT Ph.D.s. They are the chair, Greg Mankiw (Ph.D. 1984), and member Kristin Forbes (Ph.D. 1998). Mark

McClellan (Ph.D. 1993), who was a CEA member at the beginning of the current administration, is now serving as the Administrator of the Centers for Medicare and Medicaid Services. Many other department alumni serve in important roles in the policy making process in other nations and in international organizations.

Members of the Economics Department received a number of honors within the MIT community this year. In March, Peter Diamond delivered his Killian Lecture, thereby fulfilling the one requirement associated with his James R. Killian Jr. Faculty Achievement Award. This award, presented each year to an MIT faculty member who has made outstanding contributions to

scholarship, public service, and the MIT community, is the highest honor that the MIT faculty can bestow on one of its members. Peter's lecture focused on the current and future role of Social Security. Doctoral student Alexandre Debs received one of MIT's most coveted student awards, the Edward Horton Fellowship Award. The award, which was named in honor of a graduate student in physics, recognizes a student who has made outstanding contributions to graduate student life at MIT. Nancy Rose won this year's Undergraduate Economics Association Faculty Teaching Award, and Iván Werning won the teaching award presented by the Graduate Economics Association.

Economics Students: Where are they now?



Mark McClellan received his Ph.D. from the MIT Economics Department in 1993. He also holds an M.D. from the Harvard-MIT Division of Health Sciences and Technology. He has already had two very distinguished careers: one as an academic health economist and the other as a public policy participant. He has published numerous research studies on the economic factors that influence medical treatment decisions, and he has been a pioneer in the use of econometric methods to investigate the effects of medical treatments. He is an Associate Professor of Economics at Stanford, and an Associate Professor of Medicine at the Stanford Medical School. In 1998-99, McClellan spent a year at the U.S. Treasury Department as Deputy Assistant Secretary for Economic Policy. In 2001, after a brief return to Stanford, he was appointed to the President's Council of Economic Advisers. He has subsequently served as Commissioner of the Food and Drug Administration (FDA), a position for which he was confirmed in November 2002, and since March 2004, as the Administrator of the Centers for Medicare and Medicaid Services (CMS). In his time at the FDA, McClellan brought key economic insights to many dimensions of the regulatory process. At CMS, he oversees the federal government's role in the nation's health care system, and is a central participant in the implementation of the new Medicare drug benefit for senior citizens.

Department Overview

FOR OVER A CENTURY THE Department of Economics at MIT has played a leading role in economics education, research, and public service. Francis Amasa Walker, MIT's third president, introduced undergraduate studies in economics more than 100 years ago. Walker, who rose to the rank of Brigadier General in the Civil War and directed the 1870 U.S. Census, was a leading economist of his day. He was a founder and president of the American Economic Association. In the early part of this century, Davis R. Dewey, for 20 years the editor of the American Economic Review and a longtime chairman of the MIT Economics Department, played a major role in expanding economic research at MIT. Walker and Dewey's leadership, and the work of other scholars, generated great interest in economics. As a result, in 1937, the Department added graduate courses leading to a master's degree. Four years later, in 1941, the Department inaugurated the Ph.D. program that has won world renown. MIT's approach to graduate training in economics has been widely copied at other leading institutions.



Bengt **HOLMSTRÖM**
Department Head



Philip **KHOURY**
Dean

MIT established its School of Humanities, Arts, and Social Sciences (SHASS) in 1950, with the Economics Department playing a central role within the School. The School celebrated its 50th anniversary in the Fall of 2000. Dean Philip Khoury, the current dean of SHASS, presided over the festivities.

The Economics Department expanded significantly in the years following World War II, and by the 1950s, it was established as one of the world's leading centers for economic research. Graduates of the MIT Economics Department's doctoral program are now well-represented on the faculties of all of the leading economics departments in the United States and elsewhere.

The MIT Economics Department today is a vibrant collection of faculty and students. The Department's distinguished scholars have received numerous awards, including three Nobel Prizes (Paul Samuelson, Robert Solow, and the late Franco Modigliani), and many are Fellows of the National Academy of Sciences, the American Academy of Arts and Sciences, and the Econometric Society. Many faculty members have served in various elected offices of the American Economic Association and the Econometric Society. The Department offers exceptional opportunities for undergraduate and graduate study and research.

The Department continues to attract a very large undergraduate student enrollment. During the 2003-04 academic year, 1,933 undergraduates

enrolled in Economics courses. 108 undergraduates chose to major in economics, while 154 chose to minor in economics, and another 322 took economics as a concentration. Many undergraduate majors, as well as students from other departments at MIT, participated in research projects supervised by the faculty.

Each year the MIT Ph.D. program enrolls about 22 candidates selected from more than 700 applicants.

Roughly half of these students have undergraduate degrees from American universities; others come from Eastern and Western Europe, the states of the former Soviet Union, and from Latin America, Asia, and Australia. One important development of the last two decades has been a growing internationalization in the demand for graduate economics training. As nations in Eastern Europe and Asia have embraced free-market economics, there has been a sharp uptick in demand for economists and economic analysis. This has resulted in a significant increase in the number of foreign applicants to MIT's Ph.D. program.

During the 2003-04 academic year, there were 130 graduate students enrolled in the Department's Ph.D. program. Student dissertation topics span a wide range of issues in microeconomics and macroeconomics. Dissertations include theoretical work, applied data analysis, and econometric methodology.

Most doctoral candidates spend four or five years in residence at MIT taking

graduate courses and doing research. The first two years of the Ph.D. program are devoted primarily to course work, while the remainder of the program focuses on writing a doctoral dissertation. Graduates of MIT's Ph.D. program pursue diverse careers. Many take positions in academia or in domestic or international economic organizations. Others join firms in the private sector, working as economic consultants or in other capacities.

As the Internet has enabled electronic dissemination of information to replace traditional print media, the MIT Economics Department has taken steps to develop a presence in cyberspace. The Department's website provides up-to-date information on department courses and seminars. It includes links to the many web pages maintained by faculty, who often post research papers and other important information on these sites. Graduate students and economics researchers from around the world visit these web pages to download current research. In many cases, research papers are now widely read and cited months or years before they are published in academic journals.



MIT and the Nobel Prize in Economic Science

2001
George Akerlof
MIT, Ph.D. '66
Joseph Stiglitz
MIT, Ph.D. '66

2000
Daniel McFadden
MIT Professor of Economics,
1978-1991

1999
Robert Mundell
MIT, Ph.D. '56

1997
Robert Merton
MIT, Ph.D. '69

1987
Robert Solow
MIT Professor of Economics,
Emeritus

1985
Franco Modigliani
MIT Professor of Finance and
Economics (deceased)

1980
Lawrence Klein
MIT, Ph.D. '44

1970
Paul A. Samuelson
MIT Professor of Economics,
Emeritus

The Nobel Prize in Economic Science was first awarded in 1969.

Paul SAMUELSON



Robert SOLOW



Undergraduate Economics

The Economics Department at MIT has a long tradition of outstanding training of both undergraduate and graduate students. The unique analytical skills of the MIT undergraduate student body allows the faculty to offer a rigorous and comprehensive program unlike that of any other U.S. college or university.



Undergraduate Research

Undergraduate Leila Agha has been working with Professor Michael Greenstone to explore the effects of Superfund clean-ups on property values in nearby towns. Agha has compiled a detailed data base on the health risks associated with the contamination at various Superfund sites, and she has participated in the statistical analysis of property value changes. The research suggests that the increase in property values associated with clean-up often exceeds the cost of clean-up by a substantial margin.

THE ECONOMICS DEPARTMENT'S faculty is equally committed to graduate and undergraduate education.

Senior professors teach introductory microeconomics and macroeconomics courses. The Department's success in attracting exceptional undergraduates and preparing them for advanced study demonstrates the soundness of this philosophy and the excellence of the program.

Many faculty have written undergraduate and graduate textbooks that are used in colleges and universities around the world. Paul Samuelson first developed his pioneering economics text in an introductory economics course for MIT undergraduates. Rudi Dornbusch and Stanley Fischer's intermediate macroeconomics textbook introduced modern macroeconomic analysis to undergraduates and has been translated into many languages. Olivier Blanchard's recent text brings state-of-the-art macroeconomic theory and applications to undergraduates.

The undergraduate major in economics begins with a two-semester introductory sequence that explores theoretical and applied topics in microeconomics, macroeconomics, international trade, and economic development. Additional training in microeconomics, macroeconomics, statistics, and econometrics follows. Majors have a choice of additional applied and advanced courses drawn from a menu that includes public economics, industrial organization, government regulation, labor econom-

ics, monetary economics, economic development, economic history, international economics, health economics, and other courses. The level of mathematics mastery among undergraduates allows economics courses to be taught at a high level. The faculty is committed to innovation in the undergraduate curriculum. New courses are constantly being developed to bring insights from recent research into the undergraduate program. Recent or planned innovations include courses on e-commerce, the economics of the Middle East, information technology and the labor market, economics and psychology, and empirical financial economics. As part of an MIT-wide initiative on communication skills the department offers a course in which students carry out a series of increasingly independent research projects and hone their presentation skills.

The MIT Undergraduate Research Opportunities Program (UROP) supplements coursework. UROP projects allow undergraduates to participate in ongoing research in the Department and to meet with faculty members outside of class. They perform tasks such as gathering and analyzing economic data, writing computer programs, checking mathematical calculations, and gathering research materials. The Department has a dedicated undergraduate computer cluster that is frequently used by UROP students.

The Undergraduate Economics Association (UEA) provides an informal forum for students to meet and to explore various topics with faculty. Sponsored by the faculty, the UEA is

run by and for economics majors to address such issues as career planning and current topics in economic policy. Students and faculty also enjoy the relaxed interaction that the UEA provides.

Undergraduate economics majors go on to graduate work and to careers in business, government, finance, consulting, and law. Many become professional economists. Around the world, MIT graduates in economics hold distinguished positions in academia, business, and government.

About 20 percent of economics graduates enter a graduate program in economics or finance. This may be the highest yield of Ph.D. candidates for any undergraduate economics program

in the country. Approximately half of the Department's graduates choose to gain experience in business, government, consulting, and non-profit organizations before seeking out business and public policy schools for post-graduate study. The number of post-graduates choosing to study law is growing. Use of formal economics in law is likely to strengthen this connection.

Whatever their destinations, undergraduate economics majors acquire essential skills for a wide variety of jobs, an excellent foundation in economics, and an opportunity to meet faculty and fellow students in a challenging intellectual environment. The Department looks forward to providing continued leadership in economics education.

Economics Students: Where are they now?

C.C. Chen was born in Taiwan, attended high school in Japan, and came to MIT as an undergraduate in 1959. He graduated four years later with S.B. degrees in both Physics and Management. After graduation, he decided to pursue a Ph.D. in Economics. Although Chen had a limited undergraduate background in economics, Professor Charlie Kindleberger admitted him to the MIT Economics Department's Ph.D. program. Chen received his Ph.D. in 1967, and embarked on an extremely successful business career. After working for two years as a senior economist for the Mobil Oil Corporation, he joined his family's shipping company as President. Currently he serves as Group Chairman of Wan Hai Lines, one of the world's leading containerized liner shipping companies. He is also a director for many firms in the Central Trading and Development Group, which has been a pioneer in developing a major foreign direct investment program in Vietnam. In 2003, Chen endowed the Kindleberger Professorship in Applied Economics, which will memorialize Charlie Kindleberger's many important contributions both to the MIT community and to the field of economics.



Graduate Economics



ECONOMICS	
Ranked in 2021	
Rank/School	Average reputation score (5 = highest)
1. Massachusetts Institute of Technology	5.0
2. Harvard University (MA)	4.9
Princeton University (NJ)	4.9
Stanford University (CA)	4.9
University of Chicago	4.9
6. University of California-Berkeley	4.8
7. Yale University (CT)	4.7
8. Northwestern University (IL)	4.6
9. University of Pennsylvania	4.4
10. University of Wisconsin-Madison	4.2
11. University of California-Los Angeles	4.1
University of Michigan-Ann Arbor	4.1
University of Minnesota-Twin Cities	4.1
14. California Institute of Technology	4.0
Columbia University (NY)	4.0
University of Rochester (NY)	4.0
17. Cornell University (NY)	3.9
University of California-San Diego	3.9
19. Carnegie Mellon University (PA)	3.7

THE ECONOMICS DEPARTMENT'S highly regarded doctoral program annually enrolls about 22 students. The program was ranked as the best economics Ph.D. program in the United States in the most recent National Research Council study and was also ranked first by *U.S. News and World Report*. More than 70 percent of the Department's Ph.D. candidates obtain their degrees in five years or less. Doctoral students take required courses in microeconomic theory, macroeconomics, econometrics, and economic history. Students are also expected to complete four fields in economics (two major and two minor) and to pass general examinations in their major fields. The field options include public finance, industrial organization, international economics, monetary economics, labor economics, economic history, economic development, econometrics, financial economics, and advanced theory.

Graduate study at MIT consists of more than satisfying course requirements. Every major field has a weekly research workshop as well as a weekly faculty-student lunch. Faculty and students discuss research ideas at the informal lunches, while the workshops provide a more formal setting for discussion. Fall workshop schedules typically include many students introducing the research papers that they plan to present on the job market.

Graduates of the Ph.D. program teach in leading economics departments and business schools. They work on congressional staffs and government advisory councils studying economic, environmental, regulatory, and scientific policy, and with organizations such as the World Bank, the International Monetary Fund, the National Economic Council, the Council of Economic Advisors, the Federal Reserve, and the Treasury Department.



Graduate Research

The California electricity crisis of 2001 has sparked a wave of new research on the economics of regulated and deregulated electricity markets. Graduate student Eric Muehlegger is one of the researchers helping to explain the price gyrations in this market. Working with Paul Joskow, Muehlegger is investigating market power in the California electricity market. He is trying to explain the role of demand shocks and of supplier-induced temporary shortages in contributing to the extraordinary spikes in spot electricity prices during the spring of 2001. Muehlegger's findings suggest that a lack of competition in some of the spot markets for power contributed to higher prices. The results highlight the extremely important role of designing market institutions for newly deregulated markets such as electricity.



Field Lunches

A key component of the dissertation advising system at MIT is a set of weekly "field lunches" at which students who have passed their general exams try out new research ideas. The presentations can range from very early stage research, hardly more than a literature review and a few ideas for future work, to nearly-complete dissertation projects. The informality of these workshops makes it possible for students to explore research topics in a setting where no one is expected to present finished work. Faculty members view attending field lunches as a central departmental responsibility.

Many past graduates of MIT's Ph.D. program report that field lunches

were invaluable in providing them with a sounding board for new research topics. Since most thesis writers volunteer to present a talk each semester, the field lunches also have the important benefit of setting near-term, but manageable, deadlines for dissertation progress.

All students who have passed their general examinations are required to attend at least one field lunch each week and to make a presentation in at least one lunch during the course of the year. Many students present their research in multiple workshops, and thereby obtain a range of different faculty and student input. First and second year students who are carrying out research are also welcome to participate in these workshops.

Macroeconomics, International, and Development Economics

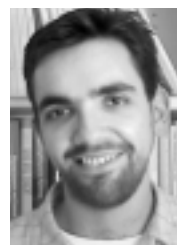


Most economics research at MIT focuses on tangible economic problems from both a theoretical and an empirical perspective. Empirical research may test theoretical models of economic behavior, or it may seek to evaluate whether current policies are effective, ineffective, or counterproductive in achieving their goals. Theoretical research may either establish new conceptual frameworks for studying markets and economic institutions, or lead to new statistical and analytical tools.

Business and government decision makers in the U.S. and abroad frequently seek out MIT faculty for help in formulating and evaluating business decisions and economic policy initiatives.



Daron ACEMOGLU



George-Marios ANGELETOS



Olivier BLANCHARD



Ricardo CABALLERO



Xavier GABAIX

MACROECONOMICS IS THE study of growth, unemployment, inflation, budget deficits and surpluses, exchange rates, stock market fluctuations, and related economic issues. International economics is the study of the effects of international trade and finance on national economies. Development economics is the study of the macroeconomic and microeconomic questions confronting less-developed nations. In many cases, the central issues in international economics and development economics have roots in macroeconomics, so these three fields are closely inter-connected.

Macroeconomics and International Economics

The MIT Economics Department has a long tradition of active interest in current macroeconomic issues, both in closed and open economies. This tradition is exemplified by the work of MIT's Nobel laureates. The current macroeconomics and international group includes Daron Acemoglu, George-Marios Angeletos, Olivier Blanchard, Ricardo Caballero, Xavier Gabaix, Mikhail Golosov, Guido Lorenzoni, Lester Thurow, and Iván Werning. In addition to this core



Mikhail GOLOSOV



Guido LORENZONI

Faculty Research



How Costly Are Recessions?

Measuring the cost of macroeconomic fluctuations is one of the core challenges facing macroeconomists. This question has been studied in a range of different models, and the findings are often inconsistent. One view, first suggested by Joseph Schumpeter, holds that recessions are beneficial because they induce productive restructuring of economic activity, “cleansing” the economy of less efficient enterprises. The counter view, traditionally associated with Keynes and many contemporary macroeconomists, argues that recessions are costly because they result in substantial quantities of underemployed resources. In a recent paper on “The Cost of Recessions Revisited: A Reverse Liquidationist View,” Ricardo Caballero and Mohamad Hammour of DELTA in Paris advance this debate by challenging a key premise of the first view. They extend previous work on the theory of firm destruction in recessions, and present new empirical work that suggests that the cumulative impact of recessions is a reduction in restructuring activity. This result is likely to draw new attention to the long-standing question of the costs of macroeconomic fluctuations.

group, several other faculty teach and do research on macroeconomic topics. They include Abhijit Banerjee, Peter Diamond, Bengt Holmström, James Poterba, and Peter Temin.

Since modern macroeconomics draws heavily on “microfoundations” in neoclassical microeconomic theory, there is much interaction among students and faculty interested in macroeconomics, international economics, and other fields. Students who plan to carry out research in these areas often find that course work in other fields, particularly economic theory, is extremely helpful in identifying research topics and in providing analytical tools for potential dissertation research.

The Department offers four undergraduate and six graduate macroeconomics courses. The undergraduate

courses range from the introductory level to advanced seminars in which students assess and participate in current research. MIT’s advanced undergraduate macroeconomics course is comparable to the graduate macroeconomics offering at many economics departments.

All Ph.D. students must take four of the six graduate macroeconomics courses. The remaining two are field courses that cover current research and prepare students to write dissertations.

An undergraduate course in international economics introduces students to the theory of international trade and finance, investigating exchange rate restrictions, economic development, and foreign aid. Two graduate courses cover traditional and modern theories of international trade and finance.



Lester THUROW



Iván WERNING

The faculty in macroeconomics maintain a very active research program. Daron Acemoglu carries out research on labor markets and macroeconomic activity. Acemoglu works on the determinants of wage inequality, in particular the increase in the relative wage of skilled workers in the past few decades. He has also worked on models of the determinants of the rate of technological change and the development of political institutions. The wide range of issues that Daron studies have made him one of the most popular dissertation advisors in the Economics Department. George-Marios Angeletos works on the interaction between fiscal policy and the maturity structure of government debt and on models of growth and volatility. Olivier Blanchard is studying high unemployment in Western Europe and the transition to market economies in Eastern Europe. His graduate text, *Lectures in Macroeconomics*, co-authored with Stanley Fischer, is a standard reference in graduate programs. Ricardo Caballero is exploring a range of issues linking asset markets, investment, and economic growth. He has recently focused on asset market crises in the third world. His current work develops models that explore the role of monetary policy, private financial markets, and other factors in contributing to “country crises.” Xavier Gabaix is working on aggregate asset price movements and the importance of firm-level shocks in contributing to aggregate economic fluctuations. Mikhail Golosov works on issues in optimal fiscal policy design, and his

work overlaps with public finance. Guido Lorenzoni investigates topics concerning open-economy macroeconomics and the sources of business cycles. Lester Thurow is carrying out ongoing work in international competition and labor markets. Iván Werning is an expert on dynamic consumer behavior and its implications for the design of social policies such as unemployment insurance.

Development Economics

Underdevelopment is one of the most profound problems in economics, and it may be the problem with the greatest human impact. At MIT the study of development began during Paul Rosenstein-Rodan's tenure. It continued through the work of Richard Eckaus, an emeritus faculty member still actively involved in research.

Today, the two faculty who most directly shape the development economics field are Abhijit Banerjee and Esther Duflo. Abhijit Banerjee is a theorist with a strong commitment to applied problems in development economics. He is currently working on issues involving credit cooperatives, tenancy reforms, and the structure of contracts in developing countries. Esther Duflo is primarily interested in empirical issues that arise in the study of developing economies. Her work focuses on education reform and technology diffusion. She has recently completed major empirical studies of education reform in Indonesia, within-family patterns of resource allocation in South Africa, and the political economy of government expenditures in India.

Many of the core issues that confront developing economies have close parallels in developed nations, and the set of MIT faculty who have studied economic policy in developing nations is

Faculty Research

Did Rosie the Riveter Affect the Wage Structure?



The wage distribution in the United States became substantially less equal in the 1980s and 1990s. This has generated interest in understanding how variation in the supply and demand for workers at different skill levels affects the wage distribution. Many studies have examined the recent experience, but in a new study published in the June 2004 *Journal of Political Economy*, Daron Acemoglu, David Autor, and former MIT student David Lyle, now at the U.S. Military Academy, explore changes in the wage structure in the years after World War II. In "Women, War, and Wages," they observe that there were substantial differences across U.S. states in the fraction of men mobilized during World War II. This led to differences in the number of women who entered the labor force during the war. Because many women who joined the labor force continued to work after the war, these inter-state differences in mobilization resulted in post-war differences in the number of women in the labor force. In the 1940s and 1950s, women were better substitutes for high-school educated men than for college educated men, since few women had been to college, so the labor force entry of women represents a positive shift in the supply of high school educated workers. Acemoglu, Autor, and Lyle trace the impact of these labor supply shifts on the wage structure, and find that states with greater female labor force participation exhibited lower wages for women and for high school educated men than states with a smaller female labor force.

far larger than the group that teaches development economics. Peter Diamond, for example, has carried out research on Social Security reform in Chile and other developing countries. Jonathan Gruber has studied the health insurance systems in several developing nations, and has also worked on Social Security issues in developing nations. Paul Joskow and Richard Schmalensee have carried out research on the design of regulatory institutions in transition economies in Eastern Europe.

The Department offers a two-semester course for graduate students in devel-

opment economics. It also hosts a joint seminar with Harvard, which attracts faculty interested in development economics from both institutions. The Department also offers two popular undergraduate courses on economic development. The courses offer students an opportunity to use



Abhijit BANERJEE



Esther DUFLO

tools from both microeconomic and macroeconomic theory to study a range of interesting policy issues in developing nations.

Many past graduates of the MIT Economics Department work at international organizations, such as the World Bank and the International Monetary Fund, where they help to design and implement economic policies for developing nations.



The MIT Poverty Action Lab

In the fight against world poverty, we know surprisingly little about what policies work best. The objective of the MIT Poverty Action Lab is to set a new standard of rigorous evaluation to answer key policy questions such as: what is the most effective approach to reducing the spread of AIDS; what policies work best for increasing girls' attendance at school; how can we promote food security in the most cost effective manner? An ongoing revolution in academic economics and related disciplines is changing the way policies are evaluated. Researchers are now using randomized trials like those used in medicine to evaluate social policies. This approach provides transparent and scientifically sound answers, and reduces the degree of dispute by policy advocates. Improvements in evaluation research have the potential to dramatically enhance the policies that are used to alleviate poverty in many nations. Led by MIT economists Abhijit Banerjee and Esther Duflo, the MIT Poverty Action Lab works with international agencies, non-governmental organizations, and governments to evaluate their poverty relief programs. It also actively disseminates the results of evaluation research to national and international policy makers and helps to plan and undertake policy evaluations. Further information about the Poverty Action Lab may be found at <http://www.povertyactionlab.com> (Photo by Abhijit Banerjee)

Faculty Research

Capital and Growth

The role of capital in contributing to economic growth is one of the central issues in development economics. Capital's contribution to growth depends both on its overall supply and on its allocation across sectors and projects. Is capital allocated efficiently across its alternative potential uses? In "The (Mis)Allocation of Capital," Abhijit Banerjee, Esther Duflo, and former MIT student Kaivan Munshi of Brown University conclude that there are substantial inefficiencies in the current allocation process. They study the operation of bank credit markets in India, particularly those that affect small scale industry. They also investigate the allocation of capital in Tirupur, a small town in southern India. In both cases, they conclude that some projects remain unfunded while others, with lower potential returns, receive capital. The results suggest that improving capital allocation could make an important contribution to economic growth.

The World Economy Laboratory



The World Economy Laboratory (WEL), founded by the Economics Department in 1992 and directed by Olivier Blanchard and Ricardo Caballero, holds conferences and presents research in a non-technical manner to international leaders in business, finance, and government. WEL members receive congressional testimony, op-ed pieces, and other current reports on economic policy by department faculty members. WEL members also participate in two annual conferences of leading economic thinkers and policy makers. Recent conferences in Washington, D.C., Santo Domingo, and New York have featured Mervyn King, Governor of the Bank of England; Laurence Meyer, former Governor of the Federal Reserve System; Greg Mankiw, Chairman of the U.S. Council of Economic Advisors; Ben Bernanke, a Governor of the Federal Reserve System; Vittorio Corbo, President of the Central Bank of Chile; Stanley Fischer, former First Deputy Managing

Director of the International Monetary Fund; Jacob Frenkel, former Governor of the Bank of Israel; Arminio Fraga, Governor of the Central Bank of Brazil; Sergey Alexashenko, First Deputy Chairman of the Central Bank of Russia; Ignazio Visco, Chief Economist of the OECD; Frederico Sturzenegger, Dean of the Universidad Torcuato di Tella Business School of Argentina, and Jean Claude Trichet, President of the European Central Bank.

WEL receives backing from a variety of sources, including foundations, government agencies, corporate sponsors, and private donors. WEL funds support policy-oriented research by junior faculty and students, and WEL encourages connections between scholars and decision makers in the public and private sectors.

Further information about WEL may be found at <http://econ-www.mit.edu/centers/wel/index.htm>.

Economics Students: Where are they now?



Laura d'Andrea Tyson is the Dean of the London Business School, a post she assumed in January 2002. A 1974 Ph.D. graduate of the MIT Economics Department, Tyson served for nearly two decades as a Professor of Economics and Business Administration at the University of California-Berkeley. Her research focused on international trade and competition policy. Dr. Tyson served in the Clinton Administration between 1993 and 1996, when she chaired the Council of Economic Advisors and was the President's National Economic Advisor. Before taking up her post as Dean of the London Business School, she was the Dean of the Haas School of Business at U.C. Berkeley.

Economic Theory



Peter DIAMOND



Glenn ELLISON

Caballero, Xavier Gabaix, Robert Gibbons, Mikhail Golosov, Steven Ross, James Snyder, and Iván Werning. In addition, many Sloan School faculty members including John Cox, Stewart Myers, Robert Pindyck, and Jiang Wang, also have significant interests in economic theory.

MIT faculty members are currently carrying out theoretical research that bears on microeconomics as well as macroeconomics. The range of current theoretical research projects is extraordinary. Abhijit Banerjee has worked on social learning and evolutionary game theory. His seminal research on “herd behavior” has proved very influential in areas ranging from price competition among firms to the behavior of prices in financial markets. Peter Diamond is examining the theoretical underpinnings of social insurance systems, with the goal of providing new insight on practical issues of policy design. Glenn Ellison, Haluk Ergin, Sergei Izmalkov, and Muhamet Yildiz specialize in game theory. Ellison’s primary focus has been on how societies might develop social norms for playing games. He has developed new abstract models and discussed potential applications, including norms for academic publishing. Izmalkov works on the economic analysis of auction models. Yildiz is an expert on games of incomplete information and has written on delays and breakdowns in bargaining. Bengt Holmström is a contract theorist. His

ALL ECONOMIC RESEARCH, whether abstract or applied, and all economic policy advice is rooted in economic theory. Substantial advances in economic science are usually based on new ways of thinking about and modeling economic phenomena. MIT’s commitment to economic theory is strong, and it is facilitated by a close collaboration between faculty members and students developing new theoretical insights, those performing empirical research, and those who are interested in framing public policy. Most of the MIT faculty who work in economic theory also have serious research and teaching interests in one or more applied fields.

Many members of the MIT Economics Department faculty teach courses in economic theory, either as part of the core curriculum for graduate students, as graduate electives, or at the undergraduate level. This group of faculty includes Abhijit Banerjee, Peter Diamond, Glenn Ellison, Haluk Ergin, Bengt Holmström, Sergei Izmalkov, and Muhamet Yildiz. Other MIT theorists include Daron Acemoglu, Ricardo

seminal work on career concerns, motivations, and the difficulties of providing incentives to teams and in complex environments has played a fundamental role in shaping the modern theory of the firm. Robert Gibbons also focuses on the economics of organizations. He has most recently worked on relational contracts and trust as determinations of firm boundaries and firm organization. Xavier Gabaix works in the emerging field of behavioral economics. His work attempts to move beyond the traditional economic paradigm of rational actors. Instead, it uses insights from psychological studies of behavior to help understand economic phenomena.

The MIT Economics Department is fortunate to have long-term visiting faculty arrangements with three world-class



Haluk ERGIN

economic theorists, Mathias Dewatripont, Ernst Fehr, and Jean Tirole, who spend a substantial period of time at MIT each year. Dewatripont, who is also affiliated with the European Centre for Advanced Research in Economics at the Université Libre de Bruxelles and whose research focuses on contract theory and modern applications of game theory, frequently teaches in the core microeconomic theory sequence. Fehr, a renowned experimental economist with a theory background, studies the influence of fairness and reciprocity on individual behavior. He teaches a class on experimental economics each fall. Jean Tirole, an internationally renowned scholar who has worked in game theory, industrial organization, regulation, and many other fields, typically lectures in MIT's industrial organization



Robert GIBBONS



Bengt HOLMSTRÖM

courses. Tirole is also a frequent summer visitor. He offers mini-courses on specialized topics in economic theory. These courses are very popular with graduate students in all stages of the Ph.D. program.

Economic theory is part of the basic undergraduate microeconomics sequence at MIT. Because MIT undergraduates have a good command of mathematical methods, and because economic theory relies on formalism and mathematical analysis, MIT's undergraduate economic theory offerings are probably more rigorous than those at any other college or university. MIT's "Principles of Economics" course, the introductory course, is typically taught at the level of intermediate microeconomic and macroeconomic theory courses at other departments.

Faculty Research

Understanding Market "Tipping"

Some markets appear to "tip," moving from one equilibrium to another, very different one in a short period of time. Yet the precise conditions under which tipping will occur are not well understood. Glenn Ellison and Harvard Professor Drew Fudenberg (MIT Ph.D. 1981) offer new insights on this issue in their new paper on "Knife-Edge or Plateau: When Do Market Models Tip?" They develop a model with two counter-balancing effects. There are positive externalities from agglomeration by similar types of individuals, but there are also benefits from being the only one of a given type in a market. The latter effect operates against agglomeration. Ellison and Fudenberg show that in a class of models with these two effects, there is a broad range of equilibria in which there will be two active markets, and in which tipping will be the exception rather than the rule. These findings suggest a need to re-think many previous conclusions about tipping.



Sergei IZMALKOV



Muhamet YILDIZ

This enables undergraduates to develop substantial expertise in economic theory when they enroll in follow-up courses in advanced microeconomic theory. Another popular undergraduate course explores applications of game theory in a wide range of economic settings, including business competition and individual decision-making.

Many former MIT undergraduates who have gone on to graduate study in economics report that their undergraduate theory courses provided a very firm foundation for graduate study. Graduate students are required to pass four half-semester core courses in microeconomic theory. The first of

these courses emphasizes price theory, the theory of consumers and producers that underlies much economic analysis. The second course focuses on game theory, and provides the key equilibrium notions that are needed to analyze interactions between firms in an industry, and between agents in many bargaining environments. The third course concentrates on general equilibrium issues, providing students with a sound background for understanding the forces that determine the nature of market outcomes. Finally, the fourth course focuses on information economics. It touches on questions of contract design, asymmetric information, moral hazard, and the working of

insurance markets. Together, these four courses provide a comprehensive introduction to modern microeconomic theory.

Graduate students who plan to specialize in economic theory, and who expect to write dissertations in this field, select a minimum of two advanced courses on general equilibrium theory, game theory, the economics of uncertainty, and contract theory. Other courses cover the theory of regulation, rational decision-making, search theory, internal organization of the firm, disequilibrium theory, and the theory of income distribution. While not all of these courses are

Economics Students: Where are they now?



Gary Loveman received his Ph.D. in 1989 from the MIT Economics Department, and he joined the faculty at the Harvard Business School, where he taught for nearly a decade. In 1998, after several years of deploying his expertise in the field of service management and executive development as a consultant for Harrah's Entertainment, Inc., he accepted a position as the firm's President and Chief Operating Officer. He was named CEO of Harrah's in 2003. Harrah's is a leading casino entertainment company, with 42,000 employees and annual revenues of more than \$4 billion. During Loveman's time at Harrah's, the company has developed a number of innovative customer loyalty and marketing initiatives, such as Total Rewards, Harrah's nationwide players card. Loveman has been named the outstanding CEO in his industry by a number of analyst surveys. He has just joined the MIT Economics Department Visiting Committee.

required for students to take general exams in economic theory, most students who study economic theory as a major field enroll in virtually all of the advanced theory courses. The set of faculty members teaching the advanced theory courses varies from year to year, and the content of these courses often varies with changes in instructors.

There is a close connection between some issues in economic theory and the modern applied field of financial economics. Much of the modern theory of asset pricing derives from research in economic theory on choice under uncertainty and the allocation of risk in security markets. A substantial body of current research on corporate financial

policy begins with insights from contract theory, and from analysis of how firms and households behave in economic environments characterized by asymmetric information. These close ties between theory and financial economics lead many students who plan to write dissertations in finance to study economic theory as one of their two primary fields of specialization.

Informal discussions take place at weekly theory lunches where graduate students may discuss current topics or present preliminary research ideas. These meetings provide group support for students writing their dissertations in economic theory. Current research developments are presented at weekly MIT-Harvard seminars.

These seminars, which host outside speakers, provide an excellent mechanism for post-graduates graduate students to learn what leading scholars are currently working on.

Economics Students: Where are they now?



Steven Levitt received his Ph.D. from the MIT Economics Department in 1994. He followed his time at MIT with a three year post-doctoral fellowship as a junior fellow at Harvard's Society of Fellows, and he then joined the faculty at the University of Chicago. Levitt's research has touched on three important areas: the economics of crime, political economy, and the economics of education. His work on the economics of crime has contributed to an empirical renaissance in this field, as he has used convincing identification strategies to provide new evidence on how public policies such as sentence length and policing intensity affect criminal activity. Levitt's research contributions have been widely celebrated, and he was honored by the American Economics Association with the 2003 John Bates Clark Medal. This honor is awarded every two years to an outstanding economist under the age of forty.

Econometrics and Statistical Methods

ECONOMETRICS RESEARCH and teaching at MIT blends the theory and practice of economic data analysis. The study of econometrics has direct roots in theoretical statistics, but it finds application in a wide range of topics in both microeconomics and macroeconomics.

Victor Chernozhukov carries out research on a range of topics in econometric theory including decision-theoretic and Bayes alternatives to generalized method of moments estimation, extreme value theory and quantile regression. He is also applying these techniques to economic problems, often in collaboration with other MIT faculty or students.

Jerry Hausman has made fundamental contributions to the econometric analysis of microeconomic data, developing new ways to estimate models of transportation, labor supply, research and development, the return to education, and stock market prices. He is currently investigating measurement error in models of discrete choice, while carrying out a range of applied studies in industrial organization and public finance.

Whitney Newey also works on micro-econometrics, but primarily from a the-

oretical perspective. He has developed methods for checking validity of, and for weakening maintained assumptions of, statistical and economic models. He has also worked on time series econometrics. His recent interests include finding improved methods for inference as well as studying the effects of tax reform on labor supply.

In addition to these core econometrics faculty, several other faculty members in the Department and the Sloan School have important interests in econometrics. Joshua Angrist is developing methods for program evaluation in labor economics. Sara Fisher Ellison carries out applied econometric studies in industrial organization, and she teaches an undergraduate course that introduces students to applied econometric research. Andrew Lo of the Sloan School is working on the econometrics of financial markets, and has worked jointly with Hausman and Newey. Thomas Stoker, another member of the Sloan School faculty, has also worked on a range of problems in micro-econometrics.

The graduate econometrics course sequence gives students the best tools available for solving difficult statistical problems. The courses cover standard topics such as linear regression, but also introduce students to the latest techniques for empirical research. Course material is updated regularly to reflect advances in the field. There is a weekly MIT-Harvard econometrics seminar.



Victor CHERNOZHUKOV



Sara FISHER ELLISON



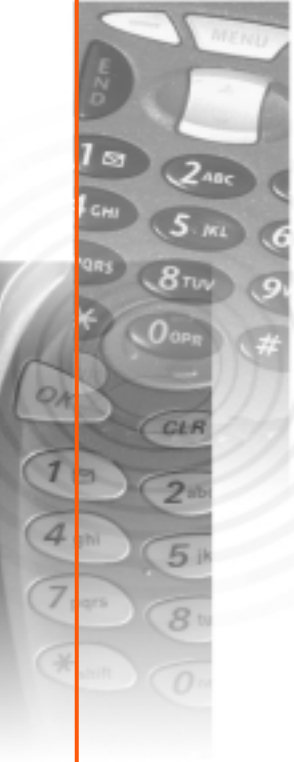
Jerry HAUSMAN



Whitney NEWEY

Faculty Research

Choose Your Estimator Carefully!



During the last fifteen years, “difference in difference” econometric models have emerged as one of the work-horse empirical strategies in labor economics, public finance, health economics, and several other fields. Most of the applied research using these models has relied on ordinary least squares (OLS) estimation methods. Recent research suggests that such methods can overstate the precision of the resulting econometric evidence, often by a substantial degree. Marianne Bertrand of the University of Chicago, Esther Duflo, and Sendhil Mullainathan of Harvard, in a widely-cited paper on “How Much Should We Trust Differences in Differences Estimates?,” (*Quarterly Journal of Economics*, February 2004), showed that failure to recognize the correlation structure across many observations in differences-in-differences studies could lead to erroneous inferences. There are standard remedies for this problem, in particular the use of feasible generalized least squares (FGLS). A new paper by Jerry Hausman and Guido Kuersteiner of Boston University, “Difference in Difference Meets Generalized Least Squares: Higher Order Properties of Hypothesis Tests,” investigates whether FGLS dominates OLS. The paper shows that using a carefully constructed FGLS procedure outperforms the OLS estimator in plausibly-constructed contexts. The new estimator proposed by Hausman and Kuersteiner could be applied in a wide range of different settings. They illustrate its usefulness by studying how regulatory reforms in the United States have affected the demand for mobile telephones.

Economics Computing at MIT

The Department provides state-of-the-art computer facilities available for use 24 hours a day, seven days a week, in both the graduate and undergraduate research labs. In addition to a number of UNIX machines operating on the campus-wide Athena network, the labs provide many high-end networked Windows XP based workstations. The latest addition to our resources is a network attached storage device which provides virtually unlimited data storage. Other network infrastructure includes a constantly expanding array of powerful, batch-processing servers (both UNIX and Windows based), high speed printers, a robust and secure data backup system that includes the availability of user accessible snapshots, color scanners, as well as a range of portable media drives. These resources are easily accessible from off site.

To support these systems, the labs are staffed by two full-time I/T professionals and a number of computer science co-op students. Graduate students may also look to several computer-lab user consultants for assistance and direction. The user consultants are drawn from the ranks of current economics Ph.D. students. They provide training for new users as well as intermediate assistance with programming problems.



Applied Microeconomics

A PPLIED MICROECONOMICS is comprised of several specialized areas of study: industrial organization and regulation, labor economics, public finance, health economics, urban economics, financial economics, and economic history.

Industrial Organization and Regulation

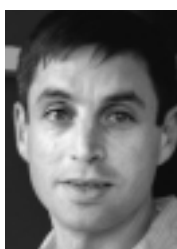
Courses in industrial organization and regulation examine the strategic behavior of firms, the effect of government regulations, and more generally, the structure, behavior, and performance of product and service markets. The Department offers undergraduate courses in industrial organization, regulatory economics, health economics, economics of telecommunications, and law and economics. Ph.D. students may take a two-semester sequence that investigates issues in industrial organization, antitrust, and regulation.

Many faculty carry out research in industrial organization. Glenn Ellison has studied incentives and agency problems in the mutual fund industry and is now working on several internet-

related topics. Sara Fisher Ellison is an expert on the pharmaceutical industry and is broadly interested in political pressures, bargaining power, and demand estimation. Michael Greenstone is studying the impact of environmental regulations on corporate productivity. He is more generally investigating the valuation of environmental amenities and the design of environmental policy. Jerry Hausman has examined the telecommunications market and written extensively on the economics of emerging industries such as the cellular telephone business. Paul Joskow, whose empirical research spans a wide range of industries, has recently studied industry restructuring and competition in the electric power sector and environmental regulation. Nancy Rose studies the effects of deregulation on performance in the airline and trucking industries as well as the effects of regulation on CEO compensation. Richard Schmalensee has examined environmental economics and regulatory policy. Peter Temin has written on the pharmaceutical industry and its regulation, and on the breakup of AT&T.

Labor Economics

Labor economics is the branch of microeconomics that includes the study of wages, employment, and labor market dynamics. There are two undergraduate courses in labor economics: one offers a comparative and historical perspective on the organization of the labor market, while the other is a more analytical course. Graduate



Michael GREENSTONE



Paul JOSKOW



Nancy ROSE



Richard SCHMALENSSEE

Faculty Research



Help for Schools?

Teacher certification has been advocated by some school reformers as a powerful device for raising teacher quality and thereby educational attainment of students. There have now been enough changes in state teacher certification laws to permit statistical analysis of the impact on teachers. Joshua Angrist and former MIT student Jonathan Guryan of the University of Chicago explore this issue in "Does Teacher Testing Raise Teacher Quality? Evidence from State Certification Programs." They point out that certification rules that restrict teacher supply should raise teacher wages, but they also observe that the testing requirement may discourage some potential teachers from trying to enter the profession. Whether the discouraged teachers are high- or low-ability remains an open issue. Angrist and Guryan find that on balance teacher certification programs have very little impact on teacher quality, as measured by the teachers' educational background.

students may take a two-semester course on modern empirical and theoretical labor economics.

Several faculty members specialize in labor economics. Daron Acemoglu has worked on a variety of topics that bear on labor markets, including job-training programs, the design of optimal unemployment insurance and the link between technical progress and wages. Joshua Angrist, who has studied the effect of labor market shocks, such as military service, on subsequent market outcomes, is a world leader in empirical labor economics. David Autor is in the midst of an important research program on job training and the labor market for temporary workers. Michael Piore is an

internationally known expert on comparative labor market institutions and their effect on labor market outcomes. Robert Gibbons works on control issues in organizations.

A number of other faculty members are working on topics related to labor economics and regularly interact with the labor group. Dora Costa applies her expertise in economic history, labor economics, and demography to the analysis of labor force participation, disability rates, and retirement decisions. Olivier Blanchard and Ricardo Caballero have examined the role of labor markets in macroeconomic fluctuations. Jonathan Gruber has studied the impact of various government policies on labor market behavior.

Joshua **ANGRIST**David **AUTOR**Michael **PIORE**Jonathan **GRUBER**James **POTERBA**William **WHEATON**

Public Economics

Public economics focuses on the design of government tax and expenditure policies and on the economic effects of these policies.

Undergraduates interested in this area may take an introductory course in public economics, and pursue related studies in environmental economics. Graduate students enroll in a two-semester public economics sequence. Several recent Ph.D. students have received the National Tax Association's annual award for the outstanding dissertation in the field of public finance, or the National Academy of Social Insurance award for the outstanding dissertation in the field of social insurance.

Several faculty members specialize in public economics. Peter Diamond is investigating social insurance programs, concentrating on programs such as Social Security. His research also spans many issues in optimal taxation and program design. Mikhail Golosov works on optimal tax issues, with a partial focus on optimal capital taxation. Jonathan Gruber is studying how social insurance programs affect household behavior. He recently served as Deputy Assistant Secretary at the U.S. Treasury Department, where he worked on issues concerning tobacco taxation and global warming. James Poterba, whose primary interest is tax policy, is examining questions such as the design of saving incentives and the impact of tax rules on house-

hold portfolio behavior. Iván Werning works on the optimal structure of social insurance programs. William Wheaton studies the dynamics of housing markets and issues in local public finance. He also serves as the Director of MIT's Center for Real Estate and teaches a course in urban economics for graduate students.

Political Economy

Political economy is the subfield of economics that considers the interplay of political factors and political institutions in determining policy outcomes. It considers economic policies as well as policies of other types. Daron Acemoglu has been studying the links between political and governance structures and economic growth. Abhijit Banerjee is investigating political economy issues that bear on economic development. James Snyder, who holds a joint appointment in Economics and Political Science, works on many of the core issues in collective choice and the economic and political effects of legislative institutions. Paul Joskow and James Poterba also have substantial interests in applied political economy, particularly with respect to regulatory and tax policy. Snyder teaches a graduate course on rational choice theory of voting, legislatures, and similar settings. Daron Acemoglu and Abhijit Banerjee have recently developed a new graduate course focusing on the interaction of political institutions and economic growth and development. Graduate students interested in political economics can also enroll in a number of other courses that are offered jointly with the Political Science Department.

Health Economics

Another specialized area that is of growing interest in public policy debate is health economics. This field is also



James SNYDER



Jeffrey HARRIS

of independent interest because of the many unique features of the health care marketplace. Jeffrey Harris, who holds an M.D. as well as a Ph.D. in economics, works on the economics of health issues ranging from smoking to AIDS. Jonathan Gruber studies labor markets, health insurance, and government health policy. He has recently completed several projects exploring the economic effects of Medicare reforms in the 1980s.

Economic History

Economic history is an important field that combines applied microeconomics and applied macroeconomics. Undergraduates may enroll in a survey course in economic history. For graduate students, one semester of economic history is required. This course is typically taken by students in their first year at MIT. The required term paper, colloquially known as "the history paper," often provides graduate students with their first opportunity to apply economic analysis to real-world questions.

Two faculty members, Dora Costa and Peter Temin, work primarily in economic history, although other faculty



Dora COSTA



Peter TEMIN



John COX



Andrew LO

also have interests in historical issues. Costa's research interests include the history of retirement, changing patterns of leisure time over the lifecycle, and the historical interplay between health, nutrition, and economic conditions. Her widely-acclaimed book, *The Evolution of Retirement*, uses data on pensions offered to Union Army veterans to provide new evidence on how pension income affects retirement decisions. Costa's research straddles issues in applied microeconomics and economic history. Peter Temin's work, in contrast, addresses issues in macroeconomic history. Temin has an ongoing interest in the source of aggregate fluctuations in the U.S. economy, and his work has played a central role in shaping modern views of the role of monetary policy in contributing to the Great Depression.

Financial Economics

Financial economics has been one of the most active fields of applied economics research in the last two decades, and MIT has been one of the centers for this research. The Black-Scholes-Merton option pricing formula was developed by MIT faculty members in the early 1970s. Stephen Ross,



Stewart MYERS



Jun PAN

who holds a joint appointment in Economics and the Sloan School of Management, developed the Arbitrage Pricing Theory and has made many other seminal contributions in financial economics. Today, a close collaboration between Sloan and the Economics Department provides students with an outstanding opportunity to learn about current insights and state-of-the-art methods in both asset pricing and corporate finance. The Sloan School finance group and the MIT Economics Department are located in the same building, only one floor apart. This provides a fertile atmosphere for research and student interaction.

A number of faculty members from the Economics Department and the Sloan School play a central role in teaching both undergraduate and graduate finance courses, and in supervising doctoral students. Stephen Ross, the first holder of the Franco Modigliani Professorship, teaches an introductory graduate course in financial economics. His research interests span a wide range of issues in virtually all sub-fields of financial economics. Some of his recent work tries to explain the mapping from the structure of consumer preferences to the structure of optimal portfolios.

Within the Economics Department, other faculty with significant interests in financial economics include Olivier Blanchard, Xavier Gabaix, Bengt Holmström, and James Poterba.

Undergraduate economics majors can enroll in the Sloan School's introduc-



Anna PAVLOVA



Stephen ROSS



Antoinette SCHOAR



Jiang WANG

tory finance course for master's students. This is a very popular undergraduate elective.

A number of Sloan faculty members teach advanced graduate courses that are popular with Economics students. Andrew Lo, whose research focuses on asset pricing and econometric analysis of security returns, teaches a course that emphasizes econometric tools and their application to financial markets.

Faculty Research

Are There Patterns in Stock Returns?



For as long as there have been traded financial claims, researchers and speculators have sought to describe the pattern of returns and to identify predictable patterns. In research with several collaborators from the field of physics, Xavier Gabaix, in "A Theory of Power-Law Distributions in Financial Market Fluctuations," offers new insights on this timeless issue. Gabaix and his co-authors suggest that "power laws," simple mathematical rules for the probability that a given outcome will be observed, provide a very useful description of stock market returns. They develop a theory for this pattern that emphasizes the trading behavior of large financial market participants, and they are able to characterize not just stock returns but the relationship between returns and trading volume and the number of trades. Forecasting future returns using these patterns is left as a challenge for the reader!

Other members of the Sloan faculty offer courses that apply insights from contract theory and other aspects of information economics to problems in corporate finance. The Sloan School boasts one of the leading finance faculties in the world, and these faculty members are a valuable resource for students in the Economics Department.

Doctoral students from the Economics Department are welcome to participate in the weekly financial economics seminar that is hosted by the Sloan finance group. This seminar provides an opportunity for learning about the current state of research in the field of financial economics. Many graduates of the Economics Department Ph.D. program are now teaching finance in business schools in the United States and abroad.

Economics Around the Institute



The Economics Department has a close relationship with many other departments and especially with MIT's Sloan School of Management. Several economics faculty members hold joint appointments in the Sloan School. Business schools and investment houses often hire MIT graduates with doctorates in economics who have taken advantage of Sloan's finance courses and research opportunities.

THE ECONOMICS DEPARTMENT benefits from interactions with the Sloan School and many other parts of MIT. The interaction between Economics and Sloan is strongest in the field of financial economics, but it is broader than this. The Sloan School has recently assembled a leading group of researchers in the economic analysis of organizational design, business strategy, and technological competition. The Sloan School's courses and seminars in these areas offer important connections to industrial organization and labor economics, and also serve as a window into current

economic research by business school faculty at MIT and elsewhere. Sloan School doctoral students often find that graduate courses taught in the Economics Department provide a base for their research. Economics Ph.D. students, at the same time, often discover that the issues studied by faculty and students in the Sloan School provide ideal applications for their research.

The MIT Center for Energy and Environmental Policy Research (CEEPR) is sponsored by the Economics Department, the Sloan School, and the MIT Energy Laboratory. The Director of CEEPR is Paul Joskow, who holds a joint appointment in the Economics Department and the Sloan School. The Center investigates economic, regulatory, and technological issues related to energy and the environment, and is supported by corporations, trade associations, environmental organizations, and grants from foundations and government agencies. The Center holds annual meetings and conferences to discuss policy issues with business and academic economists. Regular participants in CEEPR research programs include Paul Joskow, James Poterba, and Richard Schmalensee.

CEEPR is a co-sponsor of the Joint Program on the Science and Policy of Global Change, which supports research on global warming and related topics by faculty and students in the Economics Department, the Sloan School, the School of Science, and the School of Engineering. The Program provides opportunities for economics

and management faculty to work with specialists on climate change in the School of Science, and with emissions control and remediation experts in the School of Engineering.

The Economics Department also has close ties with the Political Science Department. The Political Science Department is currently in the midst of a major initiative to strengthen and emphasize its presence in the field of positive political economy. This line of research, which straddles the boundary between economics and political science, emphasizes the use of economic models and economic insights to understand decision-making in political settings. Economists in fields such as regulatory economics and public finance have increasingly come to realize that recognizing and analyzing the political factors that underlie current policies can open a rich new vein of research. Several recent graduates of the Economics Department's Ph.D. program are now recognized as leading scholars in the field of positive political economy, and the close ties between these departments should continue to produce scholars with such interests. Two faculty members, Michael Piore and James Snyder, hold joint appointments in Economics and Political Science.

The Economics Department has a long-standing relationship with MIT's Urban Studies and Planning Department. William Wheaton holds a joint appointment in that department. Another member of the Urban Studies faculty, Frank Levy, is an expert on

income and wealth distribution in the U.S. and its change over time. He is also active in the labor economics program in the Economics Department.

MIT's excellence in engineering, science, and management has created valuable educational and research opportunities for Economics Department faculty and students. The Department in turn has contributed its experience and expertise to research and education throughout the Institute.

The Economics Department Visiting Committee



John Thain is a member of the Economics Visiting Committee, the group of alumni and outside experts that evaluates the department every other year and reports to MIT's President and Provost. He graduated from MIT in 1977 with an S.B. in electrical engineering and computer science, and subsequently received an MBA at the Harvard Business School. He pursued a career in the financial services sector, and in 2003, he became President and Chief Operating Officer of Goldman Sachs, L.P. Since January 2004, he has been the Chief Executive Officer of the New York Stock Exchange. In addition to his role on the Economics Visiting Committee, Thain also serves as a member of the MIT Corporation, the Institute's ultimate governing body.

Faculty



Faculty

Faculty

K. Daron Acemoglu, Ph.D., London School of Economics; Charles P. Kindleberger Professor of Applied Economics.

George-Marios Angeletos, Ph.D., Harvard; Assistant Professor of Economics.

Joshua Angrist, Ph.D., Princeton; Professor of Economics.

David Autor, Ph.D., Harvard; Pentti J.K. Kouri Career Development Associate Professor of Economics.

Abhijit Banerjee, Ph.D., Harvard; Ford International Professor of Economics.

Olivier J. Blanchard, Ph.D., MIT; Class of 1941 Professor of Economics.

Ricardo Caballero, Ph.D., MIT; Ford International Professor of Economics.

Victor Chernozhukov, Ph.D., Stanford; Castle Krob Career Development Assistant Professor of Economics.

Dora L. Costa, Ph.D., Chicago; Professor of Economics.

Peter A. Diamond, Ph.D., MIT; Institute Professor and Professor of Economics.

Esther Duflo, Ph.D., MIT; Professor of Economics.

Glenn D. Ellison, Ph.D., MIT; Professor of Economics

Sara Fisher Ellison, Ph.D., MIT; Senior Lecturer in Economics.

Haluk Ergin, Ph.D., Princeton; Assistant Professor of Economics.

Xavier Gabaix, Ph.D., Harvard; Rudi Dornbusch Career Development Assistant Professor of Economics.

Robert Gibbons, Ph.D., Stanford; Sloan Distinguished Professor of Management and Economics.

Mikhail Golosov, Ph.D., University of Minnesota; Assistant Professor of Economics.

Michael Greenstone, Ph.D., Princeton;
3M Associate Professor of
Environmental Economics.

Jonathan Gruber, Ph.D., Harvard;
Professor of Economics.

Jeffrey E. Harris, M.D., Ph.D.,
Pennsylvania; Professor of Economics.

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