Human Evolution and Economic Growth
By Oded Galor

Professor Oded Galor has, in recent years, made advances in an exciting interdisciplinary research program that explores the dynamic interaction between human evolution and the process of economic development since the emergence of Homo sapiens. This research develops a unified evolutionary growth theory that, based on historical evidence, generates innovative hypotheses about the interplay between the process of development and human evolution, shedding new light about the origin of the observed intricate evolution of health, life expectancy, human capital, and population growth since the Neolithic revolution.

For the major part our existence humans have been subjected to persistent struggle for existence. Diminishing returns to labor along with a positive effect of the standard of living on population growth held income per-capita in the proximity of a subsistence level. Improvements in the technological environment or in the availability of land lead to larger but not richer population. The Malthusian pressure, conceivably, affected the composition of the population as well. Lineages of individuals whose characteristics were complementary to the technological environment gained an evolutionary advantage. They generated higher income, devoted more resources for child rearing, and their fraction of the population gradually rose.

See Human Evolution page 10

Growth of GDP Per Capita and Population: Western Europe, 1500-1800

Output per capita

Population

Years

2004 NASMES at Brown University

The Department of Economics at Brown University will be hosting the 2004 North American Summer Meeting of the Econometric Society. The Econometric Society is the most prestigious international scholarly organization in economics, and its North American summer meetings are one of the most important conferences in the calendar of academic events every year. The fact that the Econometric Society has asked Brown to organize this important event highlights the commitment of the department and the university to frontier academic research. The program committee is co-chaired by Roberto Serrano and Rajiv Vohra, and the local organizers are Sean Campbell, Pedro Dal Bó and Ignacio Palacios-Huerta, all faculty members in the department. The twenty-five member program committee includes seven Brown faculty members. It is expected that the conference will bring a few hundreds of participants to Providence next June.
One of the signs of a healthy academic department is its willingness to innovate. Just as individual teacher-scholars must, to stay at the front of their respective fields and to keep their lectures fresh, constantly search for new problems and for new ways of thinking about old problems, departments must constantly think about new ways of doing things. This means both improving the structure of the undergraduate and graduate programs and taking advantage of new and replacement hires to bring into the department people whose research is at the cutting edge of the discipline.

From this perspective, the Department of Economics at Brown is a healthy place indeed. On the undergraduate front we have been working with the Departmental Undergraduate Group (DUG) and the Administration to improve the quality of our concentrators’ experience while continuing to meet the large demand for economics courses from students in other departments and programs. An experiment this year using carefully selected undergraduate teaching assistants in the Principles course (which enrolls 350 every semester) and thus reducing class sizes has worked out extremely well. Further, students have expressed an interest in developing a series of senior seminars that will give them a more interactive experience in the classroom. In response we are looking for ways to free the faculty resources needed to move in this direction.

On a broader front, two of my colleagues are serving on a Provost-level commission focused on whether and how the University should respond to student demand for business-related training. Howard Rosenthal, a Chaired Professor in Politics and Economics at Princeton, is here as a Distinguished Visiting Professor and Paul MacAvoy, former dean of the School of Management at Yale and author of the forthcoming book *The Recurrent Crisis Corporate Governance* (Palgrave Macmillan) will be teaching the Economics of Regulation for us this spring.

We hope to hire two to three more faculty members this year. One of these will be in a new position authorized by the Provost as part of one of the signature multi-disciplinary initiatives announced last fall. This initiative, along with the work of our Undergraduate Group and the efforts of course instructors, has been extremely successful. The graduate program is also being closely examined. As George Borts noted in his article last year our graduate program has grown markedly over the years. We now receive 350 applicants per year and have over 20 entering students each fall. Our primary efforts in the graduate program are focused on speeding up the transition from the challenging first year core sequence to the dissertation writing stage. As illustrated by two of our current PhD students, Almudena Sevilla and Adrienne Lucas, there is strong empirical content to many of the theses produced in the department these days. To aid the transition process for these students we have introduced a new course in applied econometrics that will be taught by Sean Campbell (see Forecasting Weather Risk). A key component of the course will be to have the students replicate the analysis of some published papers by current members of the faculty. Given the artistry involved in distilling new insights from large and complex data sets, this is harder than you might think.

On the hiring front we attracted three new faculty members last year. We also have had two nationally recognized senior scholars join us as non-regular faculty. One of these will be in a new position authorized by the Provost as part of one of the signature multi-disciplinary initiatives announced last fall. This initiative, along with the work of our Undergraduate Group and the efforts of course instructors, has been extremely successful. The graduate program is also being closely examined. As George Borts noted in his article last year our graduate program has grown markedly over the years. We now receive 350 applicants per year and have over 20 entering students each fall. Our primary efforts in the graduate program are focused on speeding up the transition from the challenging first year core sequence to the dissertation writing stage. As illustrated by two of our current PhD students, Almudena Sevilla and Adrienne Lucas, there is strong empirical content to many of the theses produced in the department these days. To aid the transition process for these students we have introduced a new course in applied econometrics that will be taught by Sean Campbell (see Forecasting Weather Risk). A key component of the course will be to have the students replicate the analysis of some published papers by current members of the faculty. Given the artistry involved in distilling new insights from large and complex data sets, this is harder than you might think.
Labor and health economist Anna Aizer’s most recent publication asked whether outreach matters in Medicaid enrollment. Her conclusion: a firm Yes.

There are about 10 million uninsured children in this country. Nearly half of them are eligible to use the public health insurance program Medicaid but are not using it.

As a graduate student at UCLA, Aizer studied the effect of California’s aggressive outreach campaign to enroll families in Medicaid. With application assistance, she found that greater numbers of Asian Americans and Hispanics began to participate in the Medicaid program. Further, there was a decrease in the number of avoidable hospitalizations - those for which a patient should instead visit a doctor’s office. California’s legislators received a copy of her report. She also presented findings about advertising’s effect on Medicaid enrollment at the summer meetings of the Econometric Society and American Economic Association in 2002 and 2003.

Another aspect of Aizer’s research focuses on public investments in children in the form of subsidies for adolescent after-school programs. While much attention has been paid to the effect of childcare subsidies on outcomes for preschoolers, Aizer is interested in what happens to unsupervised teens and pre-teens before their parents return home.

Aizer received her master’s degree from the Harvard School of Public Health and her doctorate in economics from UCLA. In between, she worked at Mathematica Policy Research as a senior health analyst. It is there that she developed an interest in policy research. “There is very little research on why so many don’t use the Medicaid program,” she said. Aizer was earlier exposed to the needs of the underprivileged as a case worker for the Neighborhood Center for Homeless People in New York. She comes to Brown following a year-long postdoctoral fellowship at the Center for Research on Child Wellbeing at Princeton University.

Frank R. Kleibergen is an econometrician whose focus is improving the statistical tools used by researchers in his field. Until recently it was commonly thought that the use of a large dataset automatically implied an economic model was conducted in a statistically sound manner. But in many cases these statistical tools give the misleading indication that a researcher’s results are precise even when they are imprecise, according to Kleibergen. “There is thus a need for statistical tools that reflect these results in a more trustworthy manner,” he wrote.

Kleibergen comes to Brown from the University of Amsterdam where he was an associate professor. Earlier in his career he held faculty positions at Tilburg University and Erasmus University Rotterdam in the Netherlands.

Kleibergen highlighted the importance of his line of research by examining a 1991 study published in the Quarterly Journal of Economics. In that study, the authors used birth related variables to determine the return on education for earnings. However the large dataset did not lead to strong findings and Kleibergen subsequently found its conclusions weak.

This line of study is not limited to birth-related variables, however. Kleibergen is currently finishing a paper that explains why robust statistical
techniques need to be more precise in other cases. 
Kleibergen received his master’s degree in econometrics 
from the Erasmus University of Rotterdam, where he won 
the Economics Faculty Thesis Award. He received his 
doctorate from the University’s Tinbergen Institute.

“He has solved some problems that people had been 
working on for years,” said Andrew Foster, chairman of 
the Department of Economics.

As an undergraduate engineering student at the Indian 
Institute of Technology, Kaivan Munshi pursued a career 
in architecture. He wanted to better the world by designing 
low-cost housing, and he 
came to the United States to 
study urban design. But once 
enrolled in a master’s degree 
program at the University of 
California, Berkeley, Munshi 
was required to take a 
microeconomics course, and 
that changed his life course. 
He discovered his deep 
interest in economics and 
went on to receive a 
doctorate in the subject in 
1995 from MIT.

Munshi specializes in 
development economics, especially institutions in 
developing countries and migrant communities in the 
United States. Among his recent and forthcoming 
publications are papers about Mexican migrants in the 
U.S. labor market and about community-based credit 
networks in India. Munshi and his wife, Nancy Luke, a 
newly appointed assistant professor (research) of 
population studies, also have conducted research on the 
mariage institution in sub-Saharan Africa and India.

Munshi has held faculty positions at Boston University, the 
University of Pennsylvania, and MIT. He is also a faculty 
research fellow at the National Bureau of Economic 
Research and a member of the Working Group on 
Formation and Decay of Economic Networks at the Russell 
Sage Foundation.

Munshi is the recipient of two National Institutes of Health 
grants and a National Science Foundation grant. He will 
use the latter, a three-year award that begins this year, 
to study informal networks and economic development 
with Mark Rosenzweig, the Mohamed Kamal Professor of 
Public Policy at Harvard University.

Munshi will teach both a graduate and undergraduate 
course in the spring.

The Recurrent Crisis in 
Corporate Governance

In recent decades two crises have overtaken the American corporation—the loss of competitiveness 
in the 1980s and the loss of investor trust in the 
late 1990s. Both have in their time severely 
damaged the holdings of investors in whose 
interests the corporation operates. The first drove 
down share prices, below the inherent value of 
investor assets, as management ran the governance 
process for its own interests. The second artificially 
held share prices above asset values, in the 
aftermath of the stock market bubble, as 
management cashed out its shares just before 
bankruptcy. Both led to the question: where was 
corporate governance in general — where were 
boards of directors when management was out of 
control?

Paul MacAvoy, who will be teaching a course in the 
economics of regulation for us this spring, and his 
coauthor, Ira Millstein have just released a book, 
The Recurrent Crisis in Corporate 
Governance (Palgrave Macmillan, 2003) that 
proposes a new, responsive answer to this question 
fookus on changes in corporate conduct, 
principally by putting the board of directors fully 
in charge of management. The authors’ detailed 
analysis and critique of the past performance of 
governance imply reforms that involve three 
changes: in leadership, by a board chairman 
independent of management; in process, with new 
information flows to the board of directors; in 
responsibility, with the directors accountable for 
the results. All go far beyond current reforms, but 
are deemed necessary by the two distinguished 
authors who are long-term practitioners in the 
governance field.
entitled Spatial Structures in the Social Sciences, is focused on using such new tools as Geographic Information Systems (GIS), and will support faculty and student research that analyzes contextual social interactions across a variety of disciplines. Brown has, largely as a matter of happenstance, managed to assemble a collection of individuals from a variety of disciplines with expertise in this area. The plan is to use some incremental hires to develop this expertise into a center of excellence on campus. Vernon Henderson, who played a central roll in bringing this new initiative to life, discusses one component of his research (see Urban Agglomeration).

Our recent success in bringing active young scholars to Brown has increasingly been recognized in terms of the standing and reputation of our department. In fact, last year we were selected to host one of the most prestigious annual conferences in economics. While departmental rankings provide a somewhat arbitrary metric of stature in the field (as discussed in the article about Palacios-Huerta in our first issue) we were pleased to learn this fall that the department moved from 27th in the 1990-1994 period to 12th in the 1996-2000 period in a ranking based on per-capita publications in top journals in economics.

In closing let me just say how pleased I was with the response to our first Economics at Brown newsletter released in Spring, 2003. I received close to 100 emails and letters from alumni who took the time to share their memories of Brown, to tell me what they liked and didn’t like about the newsletter, and generally to thank the department for connecting them back to Brown and to economics in this way. I also received some good suggestions.

One of the best suggestions has resulted in “After Brown!” a new feature in the Economics Newsletter designed to increase the interaction among Brown economics alumni and students. Brown’s economics graduates have achieved success in a wide variety of fields and used their training in many ways. Although we only have room to profile a few of our alumni in each issue, we endeavor to use this forum to help create an economics alumni network which will provide support to the DUG and create the opportunity to meet old friends with similar interests.

Susan Farrell, ’72, has volunteered to serve as the first coordinator for “After Brown!” and would like to hear from those of you with suggestions for alumni profiles, interest in speaking at undergraduate forums and ways in which to strengthen the economics network. I hope you will join us in creating an exciting environment for our economics students and alumni.

Andrew Foster, Professor and Chair
afoster@brown.edu

Notes from the chair

from page 2

Gary
Becker

Nobel Prize winning economist from the University of Chicago, gave a special lecture on October 10, 2003 as part of the Graduate School’s Centennial Celebration.

Since Noah built his Ark, man has been in constant battle against the ravages of Mother Nature. Variations in the weather represent a large source of risk and uncertainty in the economy. While images of drought or large-scale famine may come to mind, it is important to recognize that even milder deviations in weather patterns may pose significant risks to businesses, investments and other sorts of economic activity. Consider for example, the effects of an unseasonably warm winter on the profitability of the skiing and tourism industry. Alternatively, while a cold winter may be good for the skiing industry it is typically bad for the construction industry because it is difficult to dig foundations and perform other sorts of outside construction activities when the temperature dips below freezing.

Given the ubiquity of weather related risks throughout the economy, one would imagine that a well developed and liquid market for trading these risks would be a permanent fixture of the modern financial landscape. Until recently, however, this was not the case. As late as 1997, the market for weather related risks was essentially non-existent. By 1998, the size of this market had grown to roughly $500 million and more recent estimates of the size of this market peg it to be north of $5 billion.

A prime example of the development of the market for weather risks is the new market for weather futures and options at the Chicago Mercantile Exchange (CME). Since 1999, the CME has been trading a set of standardized future and option contracts on the weather at large U.S. cities. For example, a ski resort in New Hampshire may now buy a future on the average temperature in Boston over the winter season. A long futures position will pay the holder if the average temperature during the winter months in Boston exceeds a pre-specified level. Likewise, a short position in this futures contract will incur a loss in the event that the average temperature exceeds this threshold.

A key question that must be addressed when thinking about the value of these financial contracts is how to model the weather. Unlike the kinds of weather forecasts that most of us see on the news each evening, these financial contracts require a model for the weather over a long period of time, typically ranging from 1-5 months. In a new research paper entitled “Weather Forecasting for Weather Derivatives,” my coauthor, Francis X. Diebold, and I bring the power and flexibility of econometric time-series methods to bear on the problem of modeling the weather and weather risks over horizons that are relevant for risk management.

We find considerable variation in weather risk across both space and time among the U.S. cities that we investigate. In particular, we find that weather risks tend to be considerably more severe during the winter than the summer. In Atlanta, for example, the variability of the weather is roughly three times higher during the winter than the summer. An implication of this finding is that financial contracts which insure holders against cooler than average winter temperatures may be considerably more valuable than contracts that insure holders against warmer than average temperatures during the summer months in Atlanta.

Weather risks also vary considerably across space. Midwestern cities such as Chicago and Des Moines are subject to considerably more fluctuation in the weather than western cities such as Las Vegas and Tucson. This suggests that overall demand for financial products which hedge against weather risks may be more robust in these locales and might benefit more from access to weather-related financial products. We also find that cities that display more predictable weather also display less variation in weather predictability over time. For example, the amount of unpredictability in the weather in Las Vegas is both rather small and roughly constant over time. In Chicago, however, weather is considerably more unpredictable than in Las Vegas and the weather is considerably more unpredictable during the winter than the summer.

Our findings highlight features of weather risks across space and time that are integral for valuing these new financial products. In ongoing research, we are investigating the price that investors need to be paid to induce them to assume weather related risks. Answering this question will provide further insight into the importance of weather related risks to the U.S. economy. In particular, an understanding of the market price of weather risk would inform public discourse on the value of different environmental policies aimed at reducing long term weather risks such as global warming.
Only 2% of the US land area is covered by human built environment. Most Americans live in densely populated cities, or urban areas, with most of US land outside intensive human habitation. But those urban environments differ markedly in the extent of their agglomeration. We have metro areas like New York that can be variously counted as having 10-18 million people, depending on just how the reach of New York is defined. However the New York’s, LA’s and Chicago’s of the world co-exist with small metro areas of 75,000 or with small cities of 25,000 people. Generally metro areas grow in absolute population size over time with human capital development. Nevertheless, over the last century the relative size distribution of cities the proportion of the urban population living in relatively bigger places versus relatively smaller ones has remained unchanged in countries like the USA, Japan, and France, despite the massive rural to urban and industrial transformation of these countries.

In Europe and the USA, the move from a relatively rural way of life to an urban one took place over a time span of 100-150 years. In the last half century, that urban agglomeration process has been playing out in developing countries, as their skill and technology levels advance. But what took 150 years among developed countries, may now take place in 30 years in some developing countries. The slow urbanization process in developed countries allowed for the incremental and corresponding development of urban institutions. These include the development of local democratic governmental structures that can manage and finance the enormous physical infrastructure requirements of roads, sewers, water mains, and parks needed in dense urban environments. And they include the development of land markets and urban planning that allows for the relatively orderly growth and spread of individual cities and numbers of cities.

In developing countries the needed institutional development must occur in a very truncated time period, under initial institutions that are inappropriate to urban governance. It is difficult to have orderly urban land development in a so-called market economy, where land ownership title is largely unwritten and the issues of who owns what piece of land stall any land use change, or where responsibility for human waste disposal is viewed culturally as the responsibility of the individual, so sewer mains are not in the planning. And with poor information systems, poor banking regulation, and inexperience, urban housing and office price bubbles such as occurred in Bangkok in 1997 reflect a degree of chaos in land development markets.

Vernon Henderson and his graduate students focus on the study of urban agglomeration, examining in a series of papers over the years these phenomena and the underlying issues they raise. In studying these urban processes, it is critical to understand why there are cities and why the extent of agglomerations or sizes of cities are so varied. Evidence suggests the main underlying force for urban agglomerations are various forms of economies of scale and scope. As Alfred Marshall described over 110 years ago, firms in dense urban environments learn from each other. The more firms there are doing things similar to what your firm does, the more you learn from them about new technologies, about prospective employees with the precise skills you need, and about what varieties of products are selling in a year, who are reliable suppliers, and who are prospective buyers. In this context, what cities do varies by size. Large metro areas are service oriented, benefiting from a wide diversity of other service activities to network with, buy from, learn from, and sell to, often in intense face-to-face interactions, all engendering enormous agglomeration benefits. Smaller metro areas beyond college towns and state governments are often more manufacturing oriented and quite specialized. They mostly benefit from a narrower set of interactions with other firms doing similar things. So we have clusters of like activities with smaller cities specialized in textiles, furniture, steel, or auto parts.

Research focuses on issues such as trying to determine the extent of scale economies as they apply to different industries, understanding the nature of networking among service firms, measuring the rapid spatial decline with distance between firms in the benefits of networking and information exchange. It also explores how productivity growth in cities is fueled both by human capital development and agglomeration, and understanding the functional-spatial specialization of firms who produce in one location in a smaller city but have headquarters in major metro areas buying advertising, financial services, legal services and the like. How are these interactions and exchanges enhanced by human capital development, such that over time we benefit from even bigger agglomerations at every part of the urban hierarchy?

Sorting out the precise influences at play is complex, requiring vast establishment level data sets that detail information on location, function, exchange and continued on page 11
Brown’s economics graduates have achieved success in a wide variety of fields and used their training in many ways. In response to alumni suggestions each issue will now profile a few of our alumni in an effort to increase communication between previous and present Brown economics students. Our desire is to create an economics alumni network which will provide support to the Departmental Undergraduate Group (DUG) and introduce friends with similar interests.

Black Gold: Working in the Energy Industry

When I left Brown in 1972, I never dreamed I would spend nearly thirty years in the energy industry. I was interested in urban economics and viewed anything to do with “big business” as bad. The European Union was in its infancy and I spent a semester in Brussels, after which I managed to talk my way into a small consulting firm working on an urban transit vehicle powered by magnetic levitation. The technology never became economic, but I moved into strategic planning using my systems training from economics. After two years, however, I realized that I just didn’t know enough about business to move ahead; I enrolled in an evening MBA program.

Six years after Brown, graduate degree in hand, I felt constrained in a small company and my personal life was also changing. I ended up re-locating to New Orleans, joining the corporate planning department of a large oilfield services company, J. Ray McDermott. Starting as an analyst and eventually becoming head of Planning and Market Analysis, I utilized my knowledge of economic fundamentals to understand global energy markets, supply/demand of products and services, and the volatility induced in a capital-intense industry where many investors make the same decision at the same time.

I transferred to London in 1994, later changing companies to become head of strategic planning for a division of another oilfield services firm, Halliburton. Again charged with assessing macro-economic markets and company positioning, my role on the executive committee seemed to be as official spokesman for the force of economic fundamentals: “Just like Econ 101,” I would repeat over and over.

In 2000, again living in the US, I finally tired of working at very large corporations. But, I certainly couldn’t leave the energy industry. What more could an economist want? - global markets, geo-politics, cartels, even wars! I ended up back where I began my career - with a small consultancy. I am now the Senior Director for PFC Energy, a specialized energy group headquartered in Washington, DC; I head their Houston practice.

The economics degree I earned from Brown has been the bedrock on which my career has rested. I cannot imagine a discipline which is more fundamental to the way the world works. A graduate may have to add specific expertise, as I did with the MBA, but the basic training teaches one to analyze problems in both a detailed and holistic way - a combination which is unique and powerful. Thank you, Brown!

Susan Farrell, ‘72

A liberal arts education is a great and direct preparation for life and therefore is at least a strong, though indirect, preparation for a particular career.

My major in economics and my academic and extracurricular record at Brown (1948-52: BA Economics; WBRU, debate team, fraternity treasurer, etc.) probably contributed to Harvard Business School overlooking the fact I was younger than most in the entering class (21 vs 26) in 1952. HBS was a very direct preparation for the career I chose. I would major in economics again (1952-54: MBA concentration in finance and manufacturing). Borts, Minsky, Taft and Stoltz were all fine professors. Minsky was my thesis advisor.
My timing could not have been better. When I left the Navy (1954-1958) for the civilian job market and sent my resume to the HBS placement office, McKinsey was just beginning to hire consultants directly from business schools. I worked for McKinsey Company, Inc. management consultants from 1958 through 1991. I have been self employed as a management consultant since then. William Kinder, '52

Leaving Brown a couple of years ago with a degree in Applied Mathematics-Economics helped me land my first (and, thus far, only) job. At Cornerstone Research, an economics and financial consulting firm, I have had the opportunity to use my Brown undergraduate economics education. The firm provides attorneys with expert testimony and economic and financial analyses in all phases of commercial litigation. In 2000, at a time when so many graduates were flocking to investment banks and management consulting firms, choosing Cornerstone allowed me to pursue a more academic experience but still be a part of a business environment. To varying degrees, I have used the knowledge I gained from Brown at Cornerstone, especially from the classes with a more mathematical nature.

For example, my first breach-of-contract case involved a complex reinsurance agreement that was similar to a put option for which the strike price changes. The binomial tree-like methods used in valuing the contract were similar to those taught in my financial markets classes.

Though there are direct applications of knowledge from my classes at Brown to my job, they arise somewhat infrequently. Indirect applications from my classes, however, arise quite often. My Brown applied math and economics education taught me how to approach both theoretical and practical problems. My experiences at Brown taught me how to learn anything. The nature of my education and the research aspects of my job have led me to apply to graduate school in economics for the upcoming fall semester. Gary Schmirer, '01

In spite of that wise advice, knowing I wanted to go into some business of my own, I selected Economics early on as my major. But of the courses available at the time, there were not many that related to a small start up business.

After Brown, and 3 years on the USS JP Kennedy, DD850, I decided to build some small boats (1956). With a sailing background, ambition, a commitment for hard work, and only $2000 from mustering out pay, it was a venture into a business, for which I had little preparation, but much good luck. The economy was good and leisure time was a new concept.

After two years building fiberglass dinghies and small outboard power boats, I moved to Bristol where by accident of a volcano, a new source of labor simultaneously arrived from the Azores. An investor approached, with an idea, and the money, to build the Triton, a 28 foot classic cruising sailing auxiliary. With new materials, we were able to produce it for one third less than the established wooden competition. Over 700 were built At our next NY Boat Show a broker appeared to offer us a public stock offering which grew 13 times in nine months. A year later Grumman Aircraft came to us with a merger offer. Except for designing the dinghies and the outboard boats, the rest was happenstance. In five years we were employing almost 500 men, with dealers on all the US coasts and lakes both great and small, building five yachts a day.

During the Malthusian epoch the growth rate of output per capita had been negligible and the standard of living had not differed greatly across countries. For instance, the average growth rate of output per capita in Western Europe was nearly zero in the years 0-1000 and 0.14 percent in the years 1000-1820. Similarly, population growth over this era followed the Malthusian pattern. The average annual rate of population growth in Western Europe was about 0 percent in the years 0-1000 and 0.1 percent in the years 1000-1820, and world population grew at an average pace of less than 0.1 percent per year from the year 1 to 1750, reflecting the slow pace of resource expansion and technological progress. As depicted below, the European take-off from the Malthusian regime was associated with the Industrial Revolution. The average growth rates of output per capita in Western Europe over the period 1820-1870 rose to an annual rate of 1.0 percent, along with an impressive increase in education. Fertility rates increased in most of Western Europe until the second half of the nineteenth century. Furthermore, the level of resources invested in each child increased as well. The acceleration in technological progress stimulated the accumulation of human capital and brought about a demographic transition in which fertility rates declined rapidly paving the way to an era of sustained economic growth with an average annual increase in income per capita of about 2 percent over the twentieth century.

The emergence from the Malthusian trap and the onset of the demographic transition raise intriguing questions about the origin of modern growth. How does one account for the sudden spurt in growth rates? Why has the positive effect of income per capita on population growth so dramatically reversed? Why had waves of rapid technological progress in the Pre-Industrial Revolution era failed to generate sustained economic growth?

In the first stage of this project, Oded Galor and his co-author Omer Moav from the Hebrew University of Jerusalem advanced a novel methodology that is designed to capture the complexity of the dynamic interaction between the economic, social, and behavioral aspects of the process of development and evolutionary processes in the human population. The proposed hybrid between Darwinian methodology and the methodology of unified theories of economic growth permits the exploration of the dynamic reciprocal interaction between the evolution of the distribution of genetic traits and the process of economic development, transcending conventional analysis of evolutionary stable strategies.

Their unified evolutionary growth theory published as the lead article in the Quarterly Journal of Economics, November 2002, suggests that the struggle for survival that had characterized most of human existence generated an evolutionary advantage to human traits that were complementary to the growth process (e.g., higher levels of life expectancy and valuation for child quality), triggering a take-off from an epoch of Malthusian stagnation to a state of sustained economic growth.
growth along with significant improvements in health, human capital, and life expectancy.

The current stage of the project focuses on the role of natural selection in the evolution of life expectancy. Galor and Moav hypothesize that socio-economic transitions that have characterized the process of development and were associated with significant increases in population density (i.e., the Neolithic Revolution and the urbanization process) triggered evolutionary processes that contributed significantly to long-lasting improvements in human longevity. The rise in the extrinsic mortality rate in the early stages of urbanization, led initially to a decline in life expectancy, but the evolutionary process that it triggered gradually increased the representation of traits associated with higher life expectancy, contributing significantly to the observed rise in longevity.

Professor Oded Galor and Ehud Schwammenthal (Director, Cardiac Rehabilitation Institute, Sheba Medical Center, Israel) argue that the increase in mortality rates in the process of urbanization have favored the survival of a hyper-reactive immune system, and may have thus increased the propensity of atherosclerosis in the population (a disease characterized by an exaggerated inflammatory response to injury). This hypothesis sheds a new light on the origin of the rise in the prevalence of atherosclerosis in the urban populations, once life-expectancy exceeded fifty years. It predicts therefore that the levels of pro-inflammatory blood markers as well as atherosclerotic morbidity and mortality would be higher among subjects who are descendants of families that resided earlier in the urban environment. This hypothesis will be tested, utilizing variations in cardiovascular mortality and bio-markers of inflammation in samples that reflect differential timing of rural-urban migration among the urban population. The theory will suggest therefore that an urban family background is an additional risk factor for the development of heart disease.

Another strand of work asks in developing countries when and whether agglomerations are too big or too small, and how costly that is. So for example in some countries, the national government favors the national capital (Bangkok, Jakarta, or Mexico City) with better access to capital, better communications and transport facilities, much greater public sector spending per capita on better health care and educational facilities, favorable treatment for firms in terms of access to FDI, import and export licenses, and the like. Competing cities are restricted in their access to capital, infrastructure investments, access to licenses and permissions, and transport access to markets.

Not surprisingly the result is to draw in masses of domestic migrants seeking jobs and better services into the national capital region. In the end that can lead to enormous mega-cities, that are difficult to govern under inadequate local institutions and which divert resources away from more productive uses. The failure of local governments to manage and provide services, housing, and land use development for urban immigrants creates the potential for enormous unrest among the less favored populations within the city. On the other hand, formal restrictions on migration such as in China may lead to under-agglomerated populations—too small cities—everywhere in the urban hierarchy and a failure to exploit underlying urban scale economies, with potentially large productivity losses. Research attempts to quantify the growth and productivity losses from excessive or deficient urban agglomeration and the role of institutions and government policy in driving excessive or deficient agglomeration.
From Math to Malaria
by Adrienne Lucas

I have always liked math, but found doing math for math’s sake unsatisfying. When I took my first undergraduate economics course, I knew that I had found my niche; it was great to learn that, as an economist, one can use math and statistics to answer questions of a more tangible nature.

After earning a B.A. in Economics from Wesleyan University in 1998 and spending three years at an economic consulting firm, I came to Brown in the fall of 2001. The difference between “economics” in the three settings is quite striking. As an undergraduate, I accepted others’ theories as the final word on a subject; in consulting, I repeatedly applied the same econometric methodology to different industries; but at Brown both the professors and graduate students are on the research frontier, constantly questioning and broadening the understanding of economics.

I am broadly interested in causes of differential economic growth. Professor David Weil and I are examining the effects of a high malaria incidence rate in infancy on the total educational level of women in Sri Lanka, and my current research looks at a micro-level potential determinant of country-level growth. Our analysis takes advantage of the fact that the incidence of malaria is very much influenced by local environmental conditions. The national eradication programs had a major influence on the incidence of malaria in some areas (i.e. those with conditions favorable to the spread of malaria), but had little impact on the incidence of malaria in others (i.e. those with conditions unfavorable to the spread of malaria). Our preliminary research indicates that there is a strong negative relationship between malaria incidence and education. By providing a precise estimate of the magnitude and strength of this relationship we hope to contribute to the discussion of whether differences in environmental conditions, through their impact on health, are an important source of national disparities in income levels. We also hope to establish more clearly the potential benefits from malaria eradication in countries where it remains a major health concern.

In addition to undertaking research, I enjoy the opportunity that teaching gives me to encourage the interest of others in economics. Although I’m only in my third year, my teaching opportunities have been outstanding. Together with Professor Rachel Friedberg, I taught “Introduction to Econometrics” last spring. I then taught the full course this past summer. I was very pleased when students commented in their reviews that they found the topic engaging and applicable outside of the classroom.

I have two more years at Brown, after which I hope to be able to continue my research and teaching at an elite liberal arts college.

Growing into Family Economics
by Almudena Sevilla

When I first came to Brown University five years ago I was determined to study “Growth Theory”: why some countries are and have remained richer than others. I took many courses on the subject helping lay down the path for further research. It was not until the end of the second year that I realized I was not devoted to what I was studying. I remembered what I had been told by many professors at different times: being passionate about your research is the key to success. I understood what they meant when we covered “fertility” in the Growth class at the end of my second year. I found myself reading about it outside of the assigned readings for the course and participating in vivid discussions during and after class. And so it started. The summer before my third year I tried to catch up on all the literature in the new field I wanted to study: Family Economics, a relatively recent term in the Economics Sciences that was pioneered by 1992 Nobel Laureate Gary Becker.

As a Spaniard I became particularly interested in the large decrease in the average number of children that took place in southern European countries during the last decades. Down from having about 3 children in 1970,
Spanish women now have about 1 child on average; 1 child less than Swedish women. This fact is not surprising by itself and economists have a well established explanation for it. Namely, women’s mean level of education (and wages) substantially increased over this period. This enlarged the outside opportunities and increased the implicit cost of remaining at home raising children and doing household chores. Women therefore opted for a reduction in the time spent at home (and therefore in family size) as they devoted more time to market work. Unfortunately, there is a problem with this argument: If Spanish women are having 1 fewer child than their Swedish counterparts, why are they not working more? (In fact, only 55% of Spanish women participate in the labor market vs. 75% in Sweden).

Understanding the above paradox is not only interesting on theoretical grounds, but has also important policy implications. The current pension system in most OECD countries is based on the current generation of workers that finances the pension benefits of the previous working generation. It becomes unsustainable with a declining population and a small percentage of women in the labor market, which decrease the number of workers who can contribute to the system. As I will address at the end of this article, it also has important implications for reevaluating policies aiming at the family and gender equality.

One of the things I realized early on in research is that when searching for an answer usually another question pops up. In this case we wondered how could it be that contrary to widespread expectations, countries with traditional gender roles and a very cohesive family structure had encouraged very few children? (copied with very low female labor force participation?). The story we tell is very simple: due to the “traditional” views on gender roles in these countries, most men will not do any chores, which impose a great cost to any individual man willing to engage in traditional female activities (such as housework or child rearing).

Consider the following example of two identical couples, one in Spain and another in Sweden. When the Spanish husband takes his child to the park he finds himself surrounded by women (and probably subject to jokes). When the Swedish husband takes his child to the park, he does not encounter such a hostile environment. As a conclusion, two identical husbands with identical wives will behave differently depending on the country they live in. The result is that, for the same number of children, the Spanish woman in our example receives no help from her partner and will have to devote more hours to household chores (leaving less time for market work). It could even be the case, as we postulate and find evidence for, that even for a smaller family size the amount of time Spanish women devote to childrearing and housework is higher than their Swedish counterparts. This explains the question we started with. Even though the average Spanish household has fewer kids than the average Swedish couple, the average Spanish woman does not have much time to devote to market work.

If you followed the above argument, you might be wondering: but Swedes have always had more egalitarian views on gender roles and Swedish men were always contributing more than Spaniards already in the 70’s. Nonetheless Spain had more children per woman back then! This is exactly right. But remember, female education (and average woman’s wage) was also lower, therefore it was worthwhile for women to stay at home rather than work in the market. Given the small proportion of men doing housework in both countries anyway, it had no effect on the average man taking his kid to the park or shopping for groceries.

Finally, the mechanism we explore, the division of housework and child care activities among spouses as an explanation for the current Mediterranean demographic patterns, has become increasingly important for policy makers. In our setting, the existence of externalities provides an argument for policy action on efficiency grounds. Recently, an increase in the paternal childcare has been suggested as a more equitable response to the dilemma, but policy instruments that might accomplish this goal are not obvious. I believe that through our research we have contributed to this different and provocative plane of looking at gender issues and family policies.
Consumer Confidence is not only a prevalent variable in today's world, but it is also representative of the typical American’s viewpoint on the state of the economy. But, just how accurate is this variable that reflects American opinion, and how much influence does this variable have on Wall Street? Is this a lagging variable that changes depending on the release outcomes of larger, more prominent macroeconomic variables? Is this reflective of what the majority of Americans investing in the stock market believe about the economy? In this thesis I will look to answer these questions by analyzing the relationships of market activity on the days that these variables are released to Wall Street.

In the first chapter of my thesis I will examine the influence of macroeconomic variables such as non-farm payrolls, unemployment levels, and many others on the level of the University of Michigan Consumer Sentiment Index. Since correlation does not imply causation, I will use a Granger Causality Test to determine if in fact these large variables influence changes in the Sentiment Index. Moreover, I will attempt to determine if there are patterns in market and trading activities on or around these release times, given certain criteria and information regarding the levels of the variables. If there are patterns that seem to be caused by these variables, then traders on Wall Street could perhaps anticipate these patterns and incorporate them into trading strategies.

In the second chapter, I will attempt to determine how much “Investor Confidence” is reflected in the Consumer Confidence index. The U. of Michigan Index surveys a wide sample of Americans, not all of whom invest in the markets. So, should this index have a large impact on equity and credit markets? Over fifty percent of Americans invest in the markets, but their proportions and stakes in the market differ. Only ten percent have more than ten thousand dollars in the stock market, besides their pensions. Therefore, how does “Investor Confidence” influence the markets? By analyzing who is investing, how much they are investing, and market activity on the release date of the U. of Michigan index, I hope to develop a broad model of “Investor Confidence” based on Consumer Confidence.

As we are slowly climbing out of a recession, all eyes watch as the Consumer Confidence Index fluctuates. Whether or not this index has a large effect on market activity, it is of great importance overall in that it quantifies American opinion about the economy. I would like to observe and study relationships between these index fluctuations, prominent macroeconomic variables, “investor confidence,” and market patterns and response.
Films are the modern medium for our collective imaginations. It is a worldwide, multibillion dollar industry. With so much at stake, a lot of thought and effort goes into hiring the best people and the best equipment in order to make the best film possible. Once finished with the film, even more money is spent marketing films through trailers, commercials, and print advertisements. Then, even more money goes towards test screening the films as well as media junkets to make sure that the film gets seen by the largest possible audience. At each phase of the production and distribution of the film, the film studio has the ability to decide how much they are willing to spend to achieve the goals that it wishes to accomplish. There is, however, one vital aspect of the films that film studios are not totally in control of: ratings. In theory, ratings have the power to enlarge or curtail the total possible size of the audience that can watch the film. In theory, ratings have the power to enlarge or curtail the total possible size of the audience that can watch the film. In the US, ratings for films are decided by the Motion Pictures Association of America, which uses vague criteria in categorizing films as G, PG, PG-13, R, and NC-17. Each rating gets progressively stricter on who can be admitted into the theater to watch the film. In theory, films with stricter ratings should make less money on average. Is this really the case? And if so, why continue to make films with higher ratings? And, is it possible to make a few alterations that can bring a film from a higher rating, like R, down to a lower rating, like PG-13? If so, how much more money, on average, can be made by doing so? How much is one minute of adult content, violence, and sex costing the studios?

Using data on the total domestic grosses and film characteristics of the top 100 films from each year for the past 20 years, the thesis will begin by showing statistically whether or not films with stricter ratings do, in fact, earn less on average than films with less severe ratings. Then, using international data on film grosses and other characteristics, we will compare films across countries. Often, a film that receives a given rating in a given country is shortened in order to receive the same or a lesser rating in another country (e.g., “Eyes Wide Shut” is 3 minutes shorter in the US than in most European countries). This analysis may shed light on the endogenous formation or determination of social values in different countries. Then, we will examine the film grosses and ratings in countries where film ratings are not decided nationally but rather provincially, like Canada or Switzerland, to see whether or not ratings had an effect on the grosses of films on a local level. In particular, in Switzerland, the driving distance among certain cantons is often small. Yet, ratings can be very different.

In the end, we wish to be able to come up with a dollar value for each minute of adult violence and sex in films, and with an idea of differences across countries in the formation and determinants of personal and societal “values.” With so much money at stake as well as the role that the film medium plays in society these days, it is clear that such a study of the ratings system would have great ramifications on how films are to be created, marketed, and viewed in the future.
I am investigating James Wilson and George Kelling's “Broken Windows” theory that suggests that a decrease in nuisance crimes such as vandalism and panhandling can lead to a decrease in greater crimes. There have been many studies on this topic, but I will examine this theory on a much smaller scale and look only at crime in Providence. I will examine whether a reduction in nuisance crimes in one neighborhood leads to a reduction in violent crimes, larceny, burglary, and motor vehicle theft in that neighborhood or in following time periods. I will also examine what happens in adjacent neighborhoods to see if a reduction in crime in one neighborhood sets a good example for adjacent neighborhoods and their crime rates begin to decline, or if the crime just migrates to neighborhoods that have not taken measures to crack down on nuisance crimes. I will do this for each type of crime to see if nuisance crimes affect different crimes in different ways.

I have very detailed data on every crime committed in Providence since 2001. The data includes street address, date, time, and type of crime.

This study will help us understand crime patterns on a very small and detailed scale. It is reasonable that changes in crime just a few blocks away can drastically alter a criminal’s habits in terms of which crimes he commits, where he commits them, or if he chooses to commit them at all. This neighborhood by neighborhood analysis will give us an insight into the motivations of Providence criminals which we can then apply to other cities. This will then suggest what policing methods would be most useful in reducing various types of crime.

Does “Broken Windows” Theory Hold True in Providence?
Tatiana Homonoff