Apparently at one point the then provost complained to one of my predecessors, Herschel Grossman, that teaching evaluations in economics were lower than those in other departments. Grossman, who never missed an opportunity to push the administration for new resources, noted that there was a strong negative relationship between course size and student evaluations and that our courses were on average quite large. Thus, he concluded that if the economics department faculty were expanded, class sizes would fall and our evaluations would rise. The provost responded “but then if your evaluations rose you would attract more students, your class sizes would rise, and evaluations would fall again—moreover, if this process continued, before long there would be no one available to teach anything else.”

At least part of the provost’s impromptu analysis seems to have been right. Over the last few years in part as a result of new hires and in part through a willingness of some of our top teachers to take on large undergraduate courses we have enjoyed a substantial increase in student course evaluations. The student-weighted average quality of lectures has risen by 30 percentage points and the un-weighted measures have risen by 15 points over the last five years. Meanwhile our enrollments are up substantially, particularly in those courses in which the ratings have increased most. Some of you may have seen the story in the Brown Daily Herald about Economics 11, which topped 500 students this spring for the first time. On top of the 360 students that took the course last fall we are now in a situation in which, if sustained, over 70% of all Brown students will have had (or placed out of) Principles by the time they graduate. As I joked with the BDH reporter, Economics 11 is as close as Brown gets to a core requirement.

Now, of course, as my skeptical colleagues will be quick to point out, this relationship need not be causal: perhaps economics education in general is becoming more popular—so students not only enroll in more economics courses but they would be enjoying more of what they are learning even if the quality of the courses in objective terms hadn’t changed at all. And clearly student evaluations are not the only way we want to measure the pedagogical quality of our courses. But I have had enough reasonably random encounters with undergrads who are excited about the developments in the department to believe that these statistical patterns capture something very real about student responses to what is going on. I do worry at times that the expansion in enrollments, should it translate into more concentrators, will make it more difficult for undergraduates to get the kind of small-class experience that helps them to really learn to think and communicate like economists. As such I am looking to increase the number of specialized, possibly limited enrollment courses, offered by the department. I am also pleased to report that the current faculty are increasingly using undergraduates as research assistants. We have a small endowment to support this activity and, until recently, some of that money went unspent. Now, however, I could spend more than twice this amount on an annual basis.

continued on page 2
The trajectory in the department that has been made possible by Boldly Brown is also being recognized outside of Brown. A recent visitor from Princeton remarked to me, “I can’t believe how big your department is!”. I responded, “I don’t really think so—we are just half the size of Princeton’s economics departments, although we have roughly the same number of undergrads”. She responded, “That’s right, I guess, but I am surprised by how many of the faculty in your department I know”. The thesis advisor of a recent job candidate from Michigan who had visited many top departments reported that his student “was really high on Brown after his return. You guys must be doing something right”. An old friend of Dean Vohra from NYU told me after giving a seminar, “You guys are really kicking around, aren’t you?”. To an outsider, of course, the department’s growing reputation as a place with a first-rate intellectual environment may seem to be a bit of a beauty contest that is at best tangentially related to our primary missions in research and teaching. But in the competitive world of the economics profession it is critical to our ability to attract and retain the highest quality faculty and students.

We also have been recognized through some new inflows of resources. The hard work we did to work with engineering and sociology to build a program in Commerce, Organization, and Entrepreneurship has paid off in the form of major gifts from the CV Starr and Kauffman Foundations. The former will fund three new chairs in areas related to COE, two of which are expected to be in economics and the latter will fund activities related to research and teaching on entrepreneurship. The department was endowed with a new chair, the James and Merryl Tisch Professor of Economics. The University also received a major gift from trustee emeritus William Rhodes in the area of International Economics. It is anticipated that these resources will be used to finance a new senior chair in international economics that will be placed in our department as well as a new Rhodes Center in International Economics. This Center, which will be physically housed in Watson, will build on our existing strengths in development and growth economics while at the same time providing us an important new dimension in terms of the analysis of international flows of financial capital, goods and services. Some new resources are also being contributed to help us access key financial data sets that will permit our students, for the first time, to get the kinds of hands on experience that will help to better understand the connection between finance theories and empirical realities. This experience should also endow them with the kinds of economic and statistical skills that will help make our undergraduates second to none in terms of competition for top jobs in the financial sector.

We are, of course, continually looking for new opportunities. We hope, in particular, to play an important role in Brown’s process of internationalization. The charge to Brown’s new “Internationalization Committee” is “to ensure that our students are adequately prepared for lives and careers in an increasingly globalized world; that the university is positioned to compete on an international stage for outstanding students and faculty, and for resources in support of research and teaching; and that as a university we are contributing in major ways to the solution of significant global problems.” As chair, I am very proud of what we are already doing in this arena, as well as the potential opportunities we have to do more. We compete for the best faculty from all over the world—while about half of us were born in the US we also have representatives from China, India, Brazil, Israel, Germany, Argentina, Spain, Canada, Greece, Australia, and Israel. Our classrooms are full of students from many parts of the world as well as descendents of recent immigrants to the US. Our graduate students and faculty are involved in research that is truly global in scope. As noted we are particularly strong in the areas of economic development and economic growth, and we hope the Rhodes Center will give us a needed presence in international economics. We are also exploring, through the Internationalization Committee, the idea of building a program that links two sets of Brown students—those with a strong interest in making a difference in the lives of people in low-income countries and those hoping to work in the international financial sector. These students tend to take very different classes within our department and around the university, but we feel that they have a great deal to learn from each other.

In any case, in the spirit of the Internationalization Committee, I have used this edition of the newsletter to highlight some of our international work. Kaivan Munshi, a development economist, talks about his fascinating work on diamond entrepreneurs in India, Ross Levine, a macro economist, discusses his work on finance and development, and Adriana Camacho, a graduate student talks about her work on the impacts of terror on children in Columbia. I have also included a short letter from one of our graduate alumni, Emmanuel Jimenez, who is working at the World Bank and headed up the World Banks Development Report on Transitions to Adulthood this year. For those of you with more domestic interests I have also included an article on the work of Assistant Professor Nate Baum-Snow as well as several articles describing the theses of our undergraduates, which focus on diverse US-focused issues. I hope you enjoy the articles and I look forward, as always, to receiving your feedback at econchair@brown.edu.
Geoffrey de Clippel, Assistant Professor of Economics, received his PhD from the Catholic University of Louvain, Belgium in 2003. He held a position as a post-doc at Brown immediately following his PhD and then moved to Rice University in 2005. De Clippel’s work is primarily in the area of cooperative game theory. A current focus of his work is the analysis of whether and how cooperative behavior can be induced under circumstances in which there are important interactions among those joining a coalition and those who are excluded from the coalition.

Kfir Eliaz, Associate Professor of Economics, received a PhD in Economics in 2001 from Tel-Aviv University in Israel. He comes to us after six years as an Assistant Professor at NYU. Eliaz is an economic theorist who does research on mechanism design in the presence of agents with bounded-rationality. For example, one recent paper explores how to best design policies for the testing for the HIV virus in the presence of a fear of testing. Eliaz has published twelve papers, four of which are in top general interest economic journals, and is the recipient of two NSF grants. Eliaz will teach courses in game theory, behavioral economics, and experimental economics.

Ken Chay, Professor of Economics, received his PhD from Princeton University in 1996. He is coming to Brown from the University of California, Berkeley, where he was promoted to Associate Professor with tenure in 2002. Ken Chay is an empirical micro-economist who has done important research in the areas of labor, health and the environment. His work is characterized by the importance of the questions being considered and the compelling nature of the inference that is provided. Among his most cited work includes an analysis of the effects of the 1970 Clean Air Act on infant mortality and a study of the impact of Civil Rights legislation on the convergence of black-white mortality in Mississippi. He is the recipient of research grants from the NICHD and the NSF.

Yona Rubinstein, Assistant Professor, received his B.A. in Economics and Business Administration in 1991, and his PhD in Economics in 2000, both from the Hebrew University of Jerusalem. Prior to coming to Brown, Yona was at the Eitan Berglas School of Economics, where he was a Senior Lecturer. He is a labor economist, and has already published several scholarly journal articles. One article, written jointly with Nobel Laureate James Heckman of the University of Chicago, shows the importance of non-cognitive skills such as sociability, persistence and dependability, in determining a person’s earnings and educational attainment. Yona will be teaching labor economics at both the graduate and undergraduate level.
Antibiotic resistance came into the news recently when Andrew Speaker, a patient with drug-resistant tuberculosis, traveled to Europe and back, and authorities feared he had exposed hundreds of fellow travelers to his disease. Extensively drug resistant tuberculosis (which doctors later determined was not Mr. Speaker’s strain) represents the nightmare scenario of a life-threatening infection that is unresponsive to available antibiotics. This extreme example highlights the global challenge of antibiotic resistance, which more often creeps below the radar. Antibiotic resistance increases the cost and undermines the effectiveness of the antibiotic treatments that have revolutionized public health in the past century.

Resistance is the negative externality associated with the consumption of antibiotics. For the patient, antibiotics bring quick relief by clearing away a bacterial infection. At the same time, taking antibiotics encourages the evolution of resistant strains. Were doctors and patients to account properly for the social costs of antibiotic treatments, they would use these drugs much more judiciously. Instead, doctors prescribe antibiotics freely in both rich and poor countries. Nearly a third of patients diagnosed with a common cold from 1995 to 1999 in Taiwan received antibiotics (Ho et al 2002), even though these drugs are not helpful against viral infections. From the doctor’s perspective, antibiotics are an effective remedy combined with a convenient diagnostic tool. From the patient’s perspective, antibiotic therapy is a sign of attentive and vigorous treatment.

The link between antibiotics and the patient’s perception of quality may be important for understanding the overconsumption of these drugs. A literature in industrial organization explores the relationship between market structure and product quality. Competition can induce firms to improve the quality of their products to avoid losing market share. Anyone who has dealt with the cable company’s customer service department may associate poor quality with market concentration. Quality competition is most salient in a price-regulated environment such as health care, in which firms cannot attract business by lowering prices. If patients associate antibiotics with the quality of an office visit, then competing doctors may be partially to blame for the overuse of these drugs.

My current research, joint with Dr. Tsai-Ling Lauderdale of Taiwan’s National Health Research Institutes and Che-Lun Hung of National Tsing Hua University, explores the link between health care competition, antibiotic consumption, and antibiotic resistance in Taiwan. In response to a growing problem with antibiotic misuse, Taiwan decisively reduced antibiotic consumption in 2001 by regulating doctors more strictly. The country’s National Health Insurance program offers affordable care to 96 percent of the population and provides a rich source of data on health care use. From this data source, we are able to correlate antibiotic consumption with the concentration of local health care markets. Dr. Lauderdale is the principal investigator for a surveillance of antibiotic resistance at a score of hospitals across Taiwan, and these data allow us to connect consumption patterns with levels of drug resistance.

This May, I traveled to Taiwan for three weeks to gather data and work closely with my collaborators on this project. The visit gave me the chance to meet with local social scientists, physicians, and officials at the Bureau of National Health Insurance and to familiarize myself with Taiwanese health care institutions. Along the way, I also made important casual observations. I noticed that small storefront clinics—each based around one or two doctors—saturate many urban areas. After catching a cold and visiting one of these clinics, a colleague turned up with five prescriptions (none for antibiotics). Had the doctor not dispensed to him so freely, he indicated that he might have taken his business elsewhere. While these observations do not make or break a research project, they offer a reality check on the plausibility of economic theories and empirical estimates. Research travel is also a chance to explore a new place, and I took the opportunity to try unfamiliar foods and learn a few words of Mandarin.

The topic of antibiotic resistance fits within my broader research interest in the role of externalities in global public health. Communicable diseases, which are the primary causes of mortality in the developing world, embody a quintessential negative externality. Therefore, market failures are bound to feature prominently in this context. The theme of externalities also arises in my previous work, which focuses on water supply, sanitation and diarrheal disease in Metro Cebu, the Philippines. In this paper, I explore the paradox that neighborhoods with better access to the generally-clean municipal water supply exhibit more severe water-borne illness. The reason may be that communities with piped water are less attentive about sanitation and waste management. Since poor sanitation has large negative externalities, the health
impact of a sanitation decline can multiply through the community and overwhelm the benefit of clean water.

My interest in this field began in the summer after my high school graduation in 1997, when I worked at an orphanage in Tegucigalpa, Honduras. This opportunity gave me first-hand look at life in a squalid urban environment and led me to economics for tools to understand the situation. A college internship at the United Nations Development Programme seeded my specific interest in the way market failures contribute to problems in public health. There I assisted a group that was creating a compendium for policymakers about the concept of global public goods. My boss asked to me to think about reasons why rich-country donors should care about malaria, AIDS, and other health crises in the developing world. The following year, my thesis at Swarthmore attempted to enumerate the costs of tropical malaria for rich countries. I found that while these costs—in terms of political instability, military expenditures, and tourism—were modest, they exceeded the estimated costs of pursuing a permanent solution to malaria, such as through a Kremer-style vaccine purchasing plan. These interests led me to the economics department at Brown, where I have enjoyed the chance to broaden my perspective further.

STRESS AND BIRTH OUTCOMES: EVIDENCE FROM TERRORIST ATTACKS IN COLOMBIA

Adriana Camacho, April 2007

Terrorism as its name suggests, intends to create fear or “terror” to the general population by affecting random victims. While major terrorist attack incidents like the World Trade Center in New York, the train bombing in Madrid, or the metro bombing in London shocked the world due to the massive loss of life, minor terrorist attacks like those occurring in Colombia, Iraq, and Israel have received less attention in the world press but are more frequent and persistent. While terrorist attacks may still be relatively infrequent, recent evidence by Becker and Rubinstein (2005) suggest that attacks generate a disproportionate amount of stress and fear, suggesting that the indirect effects may be far more wide-reaching than the direct effects.

Colombia has suffered a very long internal conflict over the past 50 years. During this conflict terrorism has occurred with an increasing intensity during the last two decades. Illegal armed groups1 have widely used a variety of terrorist activities such as kidnappings, landmine explosions, massacres, attacks to infrastructure, and car-bombs to fight, persuade, and impose their political views to the Colombian government. Coming from a country like Colombia and considering terrorism one of the biggest threats to human rights, motivated me to examine the tremendous social and economic costs of terrorism. While previous studies measuring the effects of terrorist attacks in Colombia have predominantly focused on issues such as the reduction in corporate investment due to kidnappings, damage to infrastructure, reduction in private investment and consumption, they have not considered the indirect economic costs of terrorism on variables such as human capital in the form of health. Some of these indirect costs include reduction in quality of life, disabilities, psychological stress, among other illnesses that deteriorate the human capital accumulation capacity. A study done by the international organization Medecines Sans Frontieres, concluded that the physiological effects of the conflict is Colombian’s worst public health problem, evidenced in constant anxiety, depression, sadness and fear.

The medical evidence suggests that stress in-uterus can negatively affect birth outcomes such as low birth-weight and preterm deliveries, which are directly related to neo-natal mortality, infant mortality, lower cognitive development and poorer long term socio-economic outcomes. Merging Vital Statistics Records from 1998 and 2003 with quarterly data on landmine explosions by municipality, I estimate the impact of terrorist activities, measured by landmine explosions, during the prenatal period on birth weight and preterm deliveries. I find a very significant and robust effect of terrorism on birth outcomes of children in-utero. Pregnant mothers exposed to landmine explosions delivered babies who weighed 8.7 grams less at birth than their siblings who where not exposed to any landmine explosions while in utero.

My research makes three main contributions. First, I use land mine explosions, which occur all over the country with different levels of intensity, as a new measure of exogenous stress shocks to the population. Colombia had the highest number of landmine victims in 2005, exceeding Cambodia and Afghanistan. This yields an appropriate quasi-experimental design to test the effects of stress on birth outcomes, overcoming both the difficulty of doing an experiment that would be unethical to pursue and issues of non-random residence during pregnancy. Second, I use a large data set of all live births in Colombia from 1998 to 2003, comprising approximately 4 million births, which enables me to observe multiple births by the same mother and to have robust and precise results. Third, the data allows me to link the date of the terrorist attack with the trimester of the pregnancy, which allows me to identify the exact time when pregnant woman are the most vulnerable to stress.

The findings of this paper show the existence of small but significant indirect effect of violence on birth outcomes suggesting that the effects of terrorism may be long-lasting, affecting future generations, as babies born Low Birth Weight are more likely to suffer worse health, lower cognitive abilities, reduced life expectancy and have lower productivity.

1Revolutionary Armed Forces of Colombia (FARC), National Liberation Army (ELN), and United Self-Defense Forces of Colombia (AUC)
CHASING THE DREAM: THE EFFECTS OF ANTICIPATED POST-BACCALAUREATE STUDIES AND CAREER PLANS ON FINANCIAL AID CONSIDERATIONS IN STUDENT COLLEGE CHOICES

Holly Jackson ’07

The desire of high school students to gain admission to top universities has consistently and exponentially increased in the past two decades. Media coverage of the college admissions race, and the lengths to which families are willing to go in order to secure admission to Ivy League and other top-ranked colleges, indicate the overwhelming interest in this process and its outcome. Books such as *The Overachievers* by Alexandra Robbins and Daniel Golden’s *The Price of Admissions* trace the beginnings of preparation for the college application process to children’s births. It appears that because entire lives have been spent on the quest for top-college admissions, students automatically select the top-ranked school to which they are admitted. As individuals spend more time, resources, and energy preparing the perfect college application, and as competition and tuition continue to rise at these institutions, the economic choices made and their implications become increasingly important to study. In summary, Americans are becoming more and more preoccupied with the search for, and the acquisition of the most prestigious education possible.

I became interested in the topic of higher education and the student college decision-making process when I was a senior in high school. Twenty percent of my graduating class in Colorado (class of 2003) was admitted to Ivy League universities. Of this group, only three percent declined the offers of admission and decided to attend non-Ivy League schools. I wondered what factors affected the three percent of students who decided to opt-out of the Ivy League.

Because of the intense pressure that American families appear to be placing on their children to attend the best-ranked school to which they are admitted, it would seem that financial aid packages and a lower tuition bill would not be important factors for these families in determining the school which these students ultimately attend. Previous studies have proven that higher income individuals are less affected by tuition costs and financial aid considerations in their choice of college. However, I wondered at what point students were willing to give up their top-choice (presumably the highest-ranked among the schools to which they applied), for a greater percentage of their tuition to be waived by their second or last choice schools. If students were offered 100% of tuition waived by their last choice school, and 0% of their tuition waived by their first choice school, would they accept the financial ramifications and still attend their first choice school? If so, what variables would affect this decision?

There have been numerous economic studies tracing the effects of financial aid packages related to student college choices, most notably the research conducted by Caroline Hoxby at Harvard University.

No studies have addressed the issue of whether future career goals and future plans to attend graduate school affect the willingness to compromise a first choice school for a lower tuition bill from a second or last choice school. Although previous studies have concluded that students are less likely to attend a college if its tuition is higher, I questioned whether the factor of future plans would affect this conclusion. I thought that perhaps students who planned to attend graduate school would be more willing to compromise attendance at their first choice school: that is, they would be more willing to take financial aid into account in their college decision process, since they would also be planning to pay for post-graduate study. In accordance with the findings of other studies, I expected that students who identified themselves as having a higher family income would continue to choose to attend their first choice school and to not be swayed by financial aid considerations in their choices.

In order to investigate these questions, I surveyed 103 current high school seniors at two private, college preparatory high schools in Colorado, all of whom were in the midst of applying to colleges. Since I conducted the survey prior to the receipt of acceptances or rejections from the schools to which the students applied, the responses to the survey were based solely upon the following stated assumption: the students are admitted to all of the schools to which they apply, and then must choose which school they will attend, based upon the various financial aid packages offered. The survey asked factual questions regarding student SAT scores, GPA, whether they applied for need-based financial aid or merit-based scholarships, the number of schools to which they applied, expected college major and expected field of work after graduation, graduate school plans, and family income. The survey also asked students to rank,
in order of preference, the colleges to which they applied, and what they expect to earn in their field of work within one year, five years, and ten years after college graduation. Students were also asked a series of questions regarding whether they would choose their first or second choice schools, based on various levels of tuition waivers from each school (ranging from 0% to 100%). Similarly, students were asked whether they would choose their first choice or their last choice school, depending on various levels of tuition waivers provided by each college or university.

Analysis of the survey responses shows that students who plan to pursue graduate study are willing to pay more for their undergraduate education, and are more firm in their decision to attend their first choice school, regardless of the financial aid offered by second or last choice schools. Perhaps this is due to the increasingly competitive graduate school applicant pool, and the assumption that a higher-ranked undergraduate institution offers a greater probability that the student will be admitted to a top-ranked graduate school. Also, regardless of family income level, students who plan to pursue work in business, medicine, law, and engineering are less willing to abandon their first choice school in favor of a lower tuition bill. Conversely, students planning to pursue visual and performing arts, education, non-profit sector work, and sales are more willing to attend their second or last choice schools, when greater percentages of tuition waivers are offered, again controlling for income level. Although 50% of respondents applied for need-based financial aid, and 36% of respondents applied for merit-based scholarships, on average, respondents were prepared to pay 72% of the total tuition cost of their first choice school, and 52% of respondents were prepared to pay the full 100% of tuition in order to attend their first choice school.

The increasingly competitive atmosphere in both college and graduate school admissions, as well as the cultural fascination with the strategies to gain admissions into top universities, provide a fertile environment in which to evaluate individual choices. Although there are a myriad number of factors which contribute to an individual’s choice of which school to attend, the trends which are highlighted in this study offer insights on the decision making process. Thus, although many of the students surveyed in this study applied for need-based or merit-based financial aid, the findings show that future goals can be of more importance in the student decision-making process than the financial incentives used by universities to attract applicants.

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THE MATHEMATICS OF BEAUTY: THE DIVINE PROPORTION’S EFFECT ON FACIAL ATTRACTIVENESS

Ben Safran

Beauty is a major force in our society. We are hardwired to perceive and appreciate beauty at first sight. The plastic surgery industry, comprised of professionals trained to recognize and create beauty, commanded $12.4 billion dollars on over 10 million procedures in 2005 alone.

Economics, also, has demonstrated the seminal importance of beauty. For example, in Mobius and Rosenblat’s paper Why Beauty Matters, the authors show there is a sizable beauty premium. In maze solving tasks, for which beauty has no actual effect on productivity, more beautiful workers are given higher wages. They even show that for a given level of confidence, physically attractive workers are wrongly considered more able by employers.

These findings have enormous implications for the effect of beauty. If one could objectively make oneself more beautiful, our society would reward this change with a higher wage, despite no merit-based reason for doing so. Beauty, however, is in large part a subjective science, made up of many components that make someone attractive. But what if there existed an objective system to measure, manipulate and increase attractiveness? Dr. Steven Marquardt believes there is, and at the center of his system is a number first defined by Euclid, the father of modern geometry, over two thousand years ago.

The Golden Ratio, also referred to as the Divine Proportion or phi (φ), was first called the “Extreme Mean and Ratio” by Euclid. It is continued on page 8
defined as the ratio arising when dividing a line segment into two pieces such that the ratio of the entire segment \((a + b)\) to the largest piece \(a\) equals the ratio of the largest piece \(a\) to the smaller piece \(b\). [See Figure 1]

Figure 1

Simple algebra solves this as the ratio of an irrational number, 1.618..., to 1. This number appears throughout nature (in the spiral or a sunflower seed), art (the dimension of Salvador Dali’s *Last Supper*) and architecture (the works of Le Corbusier).

Dr. Marquardt claims to have created a Phi Mask, using this extraordinary number that objectively judges facial attractiveness. In an article by Dr. Mounir Bashour, *An Objective System for Measuring Facial Attractiveness*, the author supports this claim, showing a negative correlation between deviation from the Phi Mask and facial attractiveness. But does this mask truly show the elements of phi in the human face or the power of a composite mask? In my experiment I isolated the effect of the Golden Ratio on facial attractiveness.

I took 10 subjects and modified images of their faces with state of the art plastic surgery imaging software. I identified six ratios supported by the Phi Mask and other literature, capturing the nose, eyes, cheeks and chin. Images were then randomly manipulated so that some of their proportions adhered to the Golden Ratio while others did not. I then placed modified images side by side with their original counterparts. Thus the only differences between the two images were the pre-selected ratio manipulations. Each subject had 9 different modified versions, creating 90 image pairs. Participants then chose their preference for each image pair, either for or against the modified version. 162 respondents participated in all.

Econometric analysis showed an inherent preference against the Golden Ratio modified version for all but two of the six ratios. It is less natural to modify one or more aspects of the face, and thus the “naturalness” of one’s face is more important to facial attractiveness than adhering to Golden Proportion in the case of the nose, eyes and chin. Cheek modifications, which generally made the face slimmer, are preferred despite the apparent inherent preference for naturalness.

In examining the effect of respondents’ characteristics, age, race and level of education are not significant. Their sex, however, is strongly significant. Males are about 4% more likely to select a modified image than females. This could be explained by a relatively less importance on a natural or original appearance for males, a notion supported by popular opinion that men are fueling the increased demand for plastic surgery.

Image characteristics prove even more significant. A male image is over 5% more likely to have a modified version preferred. This is only surpassed by the effect of the image’s race on its preference, the largest, and most noteworthy result. White images are over 14% more likely to have a golden ratio manipulated image preferred than non-white images. The result implies that using the Golden Ratio as an objective standard for facial attractiveness certainly is not warranted for non-whites. While the preference is against manipulations and for naturalness overall, there is an even stronger effect in non-white images. In addition, symmetry proves a significant factor, supporting literature already proving this finding. Images whose modifications were done symmetrically (to both eyes, or both cheeks) either have negative correlations go from being significant to insignificant (the case for the eyes) or have a greater positive coefficients (the case for the cheeks).

My study illustrates that much more analysis needs to be done to certify the Golden Ratio as accurate objective measure of facial attractiveness. Isolating just the ratios in my experiment shows an inherent preference for naturalness, not for the ‘Golden’ modifications. In addition more analysis needs to be done on the demographics for which the ratio is applicable, whether it be race or sex. The prospect of this extraordinary number appearing as a measurement of attractiveness is an exciting proposal, yet further examination is necessary to prove its appearance in beauty.
BANKING ON THE POOR

A Brown Ph.D. in economics hasn’t prepared me for everything that I’ve had to confront as a staff member at the World Bank. Setting up anti-corruption fiduciary controls for a multi-million dollar development project, managing a department with staff holding 30 different kinds of passports living and working in 8 countries 10,000 miles away, reading expressions and reactions during high-level meetings with ministers—or even just learning and un-learning countless bureaucratic acronyms—are all skills that I’ve had to pick up on the job. But I have always been amazed at the number of other occasions when my training at Brown, and applying the basic principles of micro (and sometimes even macro) that were drummed into me, have served me well.

The World Bank’s stature as the world’s premier development institution is due as much to its ability to generate and distill knowledge as to its financing. After all, unlike 20 years ago, there are many other institutions which are willing to provide financing for development programs and projects. There are also many research institutions that churn out more articles and reports in development economics. There are few which do both. The World Bank does and for which Brown prepared me exceedingly well: teach and conduct research. At the department of economics of the University of Western Ontario which I joined after finishing my dissertation in 1979 and where I became a tenured faculty member, as well as at the World Bank’s research units, I found out what it’s like to publish (and, inevitably and metaphorically, sometimes perish). My own published work (including several books and monographs and some 40 articles in refereed journals) spans a wide range of applied micro and welfare economics issues, including infrastructure, housing and urban development, public finance, human capital and labor economics, the private provision of social services, the economics of transfer programs and environmental economics. Some of these articles culminated in a couple of relatively high-profile publications, such as a book on pricing in the social sectors and, most recently, The World Development Report 2007 (WDR07): Development and the Next Generation where I was the lead author and staff director.

I have also been a manager of several of the Bank’s analytical and research groups. The units I had the privilege to lead were responsible for some of the most innovative analytical products of the Bank, such as the Living Standards Measurement Study surveys (LSMS), estimates of the world’s poverty (including the numbers living below the now widely used dollar-a-day poverty line), the first Bank reports on the economics of HIV/AIDS and pension reform, among others. Of course, the credit for the creativity and quality of the work goes fully to the researchers and not to me. My roles were to help frame (and often defend) the activity and, most importantly, to spot and hire the right person and match them with the right task.

On the operational side, where I’ve served since 2000 (with a one year break to lead the WDR), I have led departments that have been charged with operational activities in health, education and social protection in 2 of the Bank’s 6 regional groupings: South Asia and East Asia. I feel that this experience has ‘rounded me off’ as a development professional. My learning curve was steep at first. These units have multi-million dollar portfolios to supervise and lending programs to develop. But also important has been nurturing the relations with the countries, partners and with other Bank units—activities where I as director have been deeply engaged. Critical to the tasks were the scores of staff, more than half of whom were living in-country whom I was directly or indirectly supervising. Directing, leading, cajoling and mentoring them have led to some of my most challenging and rewarding experiences in the Bank.

Even in these more operational activities, applying “first principles” learned by economists such as incentive compatibility, constrained optimization and cost-effective redistribution has been enormously helpful. As a more specific example, the kind of research that Brown faculty now do and the type of training they impart to their Ph.D. students in applied micro-econometrics is exactly what is needed to inform the diagnostics and economic evaluations of programs that the Bank helps governments conduct. Large household surveys that countries collect lend themselves to analysis that is crucial to informing policies that reduce poverty: who are the poor? What are their characteristics? What kinds of credit, urban development, education and health programs make them better off? How can these programs be made more effective? In fact, several Brown faculty and graduates have been working in the Bank as consultants and staff doing exactly this kind of analysis.

I may not have realized all this back when I was sweating through the core and comprehensive exams in Robinson Hall over 30 years ago. But with the wisdom of hindsight, I can now say it was well worth it.

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Staff Director, World Development Report 2007
The World Bank
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Banks matter. Most noticeably, banks matter when they fail. Indeed, the fiscal costs of banking crises in developing countries in the 1980s and 1990s exceeded $1 trillion, and Japan’s banking problems alone crossed this threshold. Banks also matter for long-run economic growth. Banks that mobilize and allocate savings efficiently, allocate capital to endeavors with the highest expected social returns, and exert sound governance over funded firms foster innovation and growth. Banks that instead funnel credit to the connected and politically powerful discourage entrepreneurship and impede economic development. Banks also matter for poverty and income distribution. Well-functioning banks that extend credit to those with the best projects, rather than only to the wealthy and politically connected, exert an equalizing affect on the distribution of income. These well-functioning banks disproportionately help the poor by de-linking the ability to fund good ideas from the past accumulation of wealth.

Consequently, the International Monetary Fund and World Bank have developed extensive checklists of “best practice” recommendations regarding bank regulation that they urge all countries to adopt. Most influential, the Basel Committee on Bank Supervision recently adopted guidelines that substantially extend the 1988 Basel Capital Accord. The first pillar of these recommendations develops more extensive procedures for computing minimum bank capital requirements. The second pillar focuses on enhancing official supervisory practices and ensuring that supervisory agencies have the power to scrutinize and discipline banks. The third pillar envisions greater market discipline of banks through policies that force banks to disclose accurate, transparent information. Although considerable debate surrounds the validity of these pillars, over 150 countries have already stated that they will adopt Basel II.

Data
Yet, until recently, nobody had collected data to examine whether these influential recommendations work. So, with two collaborators and funding from the World Bank, I assembled an international database on banking policies to assess which policies best promote sound banking around the world. In terms of defining “sound banking,” many take for granted that stability is the primary objective of bank regulation. But, banks are not simply safe places to stash funds. Banks play pivotal roles in mobilizing and allocating resources, monitoring firms, and providing liquidity and risk management services. Thus, bank regulation and supervision should be judged by these criteria too, not just stability.

A Political Economy Approach
I find that bank regulations reflect broad approaches to the role of government in the economy. Some governments choose an active, hands-on approach, where the government owns much of the banking industry, restricts banks from engaging in non-lending activities such as securities underwriting, insurance, real estate, and non-financial service activities, limits the entry of new domestic and foreign banks, and creates a powerful supervisory agency that directly oversees and disciplines banks. Other countries rely substantially less on direct government control of banks. These countries place comparatively greater emphasis on forcing banks to disclose accurate information to the public as a mechanism for facilitating private sector governance of banks. Thus, some of my research can be viewed as using the laboratory of bank regulation continued on page 11
and supervision to assess the historic debate about the proper role of government in the economy. These patterns also highlight (i) the potential pitfalls associated with attempting to design a uniform set of best practice recommendations for countries with different political and legal systems and (ii) the likelihood that the same regulations may work very differently in different institutional settings.

Consider two broad views of government. The public interest view stresses that market failures are big. From this perspective, a powerful government agency that directly monitors and disciplines banks can improve bank operations. In contrast, the private interest view stresses that government failures are big. The private interest view holds that politicians and government agencies maximize their own welfare. Thus, if bank supervisory agencies have substantial influence over bank decisions, then politicians and supervisors may abuse this power to force banks to divert the flow of credit to ends that satisfy the private interests of politicians and supervisors, not the interests of the broader public. Under these conditions, strengthening official oversight of banks may reduce bank efficiency and intensify corruption in lending.

According to the private interest view, most countries do not have political and legal systems that induce politicians and government officials to act in the best interests of society. Thus heavy regulation of bank activities and direct, hands-on influence over banks is unlikely to promote sound banking. Rather, the private interest view holds that the most efficacious approach to bank supervision relies on using government regulations and institutions to empower private monitoring of banks. Specifically, the private interest approach advocates effective information disclosure rules and sound contract enforcement systems so that private investors can use this information to exert sound corporate governance over banks with positive ramifications on bank operations. This is not a laissez-faire approach. To the contrary, the private interest approach stresses that strong legal and regulatory institutions are necessary for reducing information and contract enforcement costs.

**Initial Results on What Works and What Does Not**

So far, my research supports the private interest view of bank regulation. Bank regulations and supervisory practices that force banks to disclose accurate information to the public tend to: (1) boost the development of the banking system, (2) increase the efficiency of the banking system, and (3) reduce corruption in lending. Furthermore, information disclosure rules are particularly effective at reducing corruption in lending in countries with well-functioning legal institutions. Thus, private investors need both information and legal tools to exert sound governance over banks.

In contrast, the results do not support the public interest view of regulation and raise a cautionary flag regarding reliance on direct official oversight of banks. I never find that giving official supervisors greater powers to force a bank to change its internal organizational structure, suspend dividends, stop bonuses, halt management fees, force banks to constitute provisions against actual or potential loses as determined by the supervisory agency, supersede the legal rights of shareholders, remove and replace managers and directors, obtain information from external auditors, and take legal action against auditors for negligence enhances bank operations or reduces bank fragility. Similarly, greater government ownership of banks, regulatory restrictions on bank activities, and limitations on the entry of new banks have never have positive effects. While some theories predict that strengthening direct official oversight and regulation of banks will promote social welfare in countries with well-functioning political and legal institutions, we do not find support for this hypothesis either.

**Extensions**

I have also examined why countries choose different bank policies. Perhaps not surprisingly, the data indicate that countries with more open, competitive, democratic political systems that have effective constraints on executive power tend to adopt an approach to bank supervision and regulation that relies more on private monitoring, imposes fewer regulatory restrictions on bank activities and the entry of new banks, and has less of a role for government-owned banks. In contrast, countries with more closed, uncompetitive, autocratic political institutions that impose ineffective constraints on the executive tend to rely less on private monitoring, impose more restrictions on bank activities and new bank entry, and create a bigger role for government banks. These findings underscore the difficulty in deriving uniform best practice guidelines for countries around the world.
Federal, state and local governments spent over 25 billion dollars to establish or expand rail transit infrastructure in sixteen major U.S. metropolitan areas between 1970 and 2000. Billions more have been invested to maintain and improve existing rail transit lines. Despite the significant infrastructure improvements associated with these investments, public transit ridership, including bus and rail, has been declining rapidly. Between 1970 and 2000, the fraction of metropolitan area commuters in the United States using public transit declined from 0.12 to 0.06. Moreover, most of the sixteen cities with expansions in infrastructure during this period also exhibited flat or declining ridership. Los Angeles, Sacramento and San Jose are the only exceptions, though less than 7 percent of commuters in 2000 used transit in each of these three cities.

In joint work with Matthew E. Kahn of Tufts University, I document these trends in the data, attempt to better understand reasons for observed declines in transit use, estimate causal relationships between transit ridership and rail access and calculate welfare estimates of the value of new rail lines built since 1980.¹

A closer look at the data reveals that residential suburbanization has played an important role in generating declining transit use. In each of the sixteen cities studied, we calculate that transit use would have been higher in 2000 had the population remained at its spatial distribution from 1970. To perform this calculation, we apply commuting mode choices from 2000 to residential location patterns from 1970. By this calculation, counterfactual commuting market share held by transit nationwide would have been 10 percent rather than the 6 percent observed in the data. In the thirteen metropolitan areas that established rail systems between 1970 and 2000, new construction is associated with an increase from 8 to 9 percent in transit commuting holding the population at its 1970 spatial distribution. This is in contrast to the observed decline in use from 8 percent to 6 percent among new rail transit cities during this period.

This observation points to the importance of space and commuting patterns in determining the extent to which new rail lines have the potential to attract riders. In particular, causal relationships between rail transit access and use are likely to differ both within and across cities. Those who work in city centers and commute by bus are likely to live close to work whereas drivers are more likely to be suburbanites. Therefore, a new rail line’s impact on total transit use should be larger in the suburbs. The fact that a rail line’s catchment area of potential riders is larger in the suburbs only reinforces this prediction. In addition, one may expect the size of the effects of ridership to differ as a function of metropolitan area structure. More centralized metropolitan areas should exhibit greater impacts of new rail lines on transit ridership because their population densities are greater and public transit is likely to conveniently serve more commuters.

In this study, we empirically examine causal relationships between rail transit construction and use by comparing the changes in ridership seen in areas of cities near newly constructed rail lines to observationally equivalent areas that did not receive new rail transit service. Commensurate with the intuition given above, we find that new rail lines increase transit ridership by up to 10 percentage points for those living in the suburbs but only by up to 3 percentage points for those living near city centers over the course of up to 10 years after rail lines are installed. Atlanta, Washington and Boston exhibited the largest responses in suburban ridership to increased rail transit access. Magnitudes of the estimated suburban causal effects are generally larger in denser cities and increase slightly when looking over time windows of longer than 10 years.

No relationship is found between city size or density and effects of rail transit lines on ridership near city centers.

These empirical estimates allow for a rough calculation of the welfare gains associated with new rail transit lines. In contrast to the pollution and congestion reductions touted by many rail transit proponents, we argue that the primary social benefit associated with new rail lines is that they may significantly reduce commuting trip times. Given that the majority of rail transit riders are former bus users, mode switching to rail has the potential to represent large aggregate time savings. Based on their mode-switching results and data on commute times, we predict the aggregate commuting time saved because of rail lines built between 1980 and 2000 in each of the sixteen cities studied. While most cities experienced only a few thousand hours of commuting time saved per day, Washington, DC stands out as a city in which rail lines appear to have had a large impact on aggregate commuting time. If commuting time is valued at the wage rate, this amounts to at least 1.5 million dollars per day surplus that Washington commuters get as a result of the reduced commuting times facilitated by their new rail system.

While measurable commuting time reductions associated with new rail lines exist in most of the cities studied, they are usually not anywhere near high enough to offset construction and operating costs net of fare revenue. Nevertheless, the building boom of rail transit systems continues unabated in the United States. Phoenix, Seattle, Minneapolis and Charlotte have opened or started construction on new rail transit systems since 2000. Based on the evidence we collected, these cities may not see the ridership gains or commuting time savings they might have expected. ■

From Farming to International Business: The Social Auspices of Entrepreneurship in a Growing Economy

Kaivan Munshi

Entrepreneurship—the successful establishment and management of new business—plays a critical role in the development process. Although economists tend to focus on barriers to (bank) credit as the chief constraint to new entrepreneurship, business success in a developing economy also requires a knowledge of the system; how to take advantage of legal loopholes, whom to bribe, and how to make connections to buyers, sellers, bank loan officers, and government officials. In such an economy, an individual who is born into a business family has a distinct advantage with the experience and training that he receives from his father allowing him to exploit business opportunities when they become available. An individual who is born into a business community has an additional advantage, net of his family background, because community-based networks provide credit, insurance, and business connections for their members.

Under these circumstances, it is not surprising that business has been traditionally concentrated in the hands of a few small communities in most developing countries. A recent article in the Times of India (October 20, 2006), for example, reported that 35% of the market capitalization of the Bombay Stock Exchange was accounted for by companies that were promoted by members of three business communities; the Gujaratis, the Marwaris, and the Parsis. As economies like the Indian economy restructure, the demand for fresh entrepreneurs will inevitably outstrip the supply from a few small business communities. A critical question is whether these economies will be able to draw from a wider pool of entrepreneurial talent in the future to embark on a steeper growth trajectory and emerge as global economic powers.

My research indicates that the answer to this question is in the affirmative. Occupational mobility can occur, even in economies where connections and a business background are important, through the endogenous formation of new networks. In this study, I show theoretically and empirically that business networks can actually strengthen most rapidly in groups without a business background once they do crystallize, compensating for the inherent disadvantage faced by first-generation entrepreneurs. These conclusions are based on a detailed study of the Indian diamond industry conducted over a four-year period, the results of which are summarized below.

India does not produce rough diamonds. The rough diamonds must first be imported, typically from Antwerp, and then cut and polished in factories or workshops, most of which are located in the city of Surat, north of Bombay. The polished diamonds are subsequently sold on the Bombay market to foreign buyers or shipped directly abroad. A combination of commercial acumen and cheap labor facilitated the rapid expansion of the diamond industry, which accounts for roughly 15% of India’s total merchandize exports and has competed with textiles, and more recently computer software, as the country’s top export industry over the past three decades. It is estimated that approximately one thousand Indian diamond export firms employ over a million workers, accounting for as much as 85% of the rough diamonds cut and polished worldwide today.

While the Indian diamond industry has acquired both domestic and global significance, what I found most interesting about this industry was a change in its sociological composition over the past four decades. Diamonds, particularly rough diamonds, are difficult to value objectively and can be easily swapped. Diamond contracts consequently rarely involve written contracts; trust plays an important role in this industry, which is heavily networked worldwide. In India, two traditional business communities—Gujarati Jains from the town of Palanpur (known in the industry as Palanpuri) and Marwaris originally from the state of Rajasthan—dominated the business end of the diamond industry from its inception in the mid-1960s. The cutting and polishing of the diamonds was left to Kanbi Patels from Saurashtra in the interior of Gujarat (known in the industry as Kathiawari), a caste of agricultural laborers and sharecroppers who migrated to Surat when the industry first started to grow. The story in the industry is that an exogenous increase in the world supply of rough diamonds in the late 1970s, which could not be handled by the existing networks, led some of the Palanpuri businessmen to open the door to the diamond trade to their trusted Kathiawari contractors. The critical step in the diamond business is accessing rough diamonds from abroad. Palanpuri businessmen, who had established branches in Antwerp by that time, provided excess roughs to their contractors or served as guarantors for other suppliers. The early Kathiawari entrants took advantage of this opportunity to bring other members of the community into business, providing connections to rough suppliers in Antwerp and other forms of support, and the Kathiawaris are now major players in
the diamond industry. My objective is to document the role played by an underlying community network in this transition as well as to investigate the mechanism by which the Kathiawari network strengthened over time.

Although aggregate statistics on the diamond industry are available over many years, the specific information required to accomplish this research objective could only be accomplished by surveying firms in the industry. Diamond firms are notoriously secretive and so I made a special effort to build connections within the industry over a two-year period before launching the survey. My network of influential exporters provided the survey team with referrals to firms they were well acquainted with and those firms, in turn, provided additional referrals until all firms on a comprehensive list of exporters provided by the Gem and Jewelry Export Promotion Council (GJEPC) had been covered. Among the 777 firms ultimately interviewed, 96% belong to the three major communities, emphasizing the importance of community affiliation in this industry. Closer inspection of the pattern of referrals received by the survey team reinforces this view; for example, Kathiawaris make up 19% of the firms in the sample, yet 74% of the referrals from Kathiawari exporters were made to other Kathiawaris. Similar community-bias is observed with the Palanpuris and Marwaris, who account for 54% and 17% of all firms, but made 79% and 43% of their referrals to their own community.

The survey collected information on the senior partner’s personal and family background, the firm’s history, and its business relationships over time. The description of the industry provided earlier would suggest that exporters from the three communities should come from very different backgrounds. Figure 1 plots the probability that the entrepreneur’s father was not a farmer on the Y-axis against the firm’s establishment year on the X-axis (after controlling for the entrepreneur’s age). The fathers of almost all the Marwaris and Palanpuris had jobs outside agriculture and this pattern has not changed over time. While the Kathiawaris are not surprisingly more likely to be from agricultural backgrounds, the striking feature of Figure 1 is the steady increase in the number of entrants who report that their fathers were farmers over time. Almost all entrants came from non-farming backgrounds in 1975, but by 1990 over 60% of the Kathiawari entrants came from farming backgrounds.

How do Kathiawari entrepreneurs with increasingly weak family backgrounds survive in this industry? My interpretation of Figure 1 is that a rapidly strengthening Kathiawari network, providing referrals to rough suppliers in Antwerp for its members, was able to support increasingly weak entrants at the margin. A strong implication of this view is that the performance of Kathiawari firms should not lag behind their Marwari and Palanpuri rivals over time if their network is successfully compensating for their weakening family backgrounds. A related implication is that the Kathiawaris should actually do better than the Marwaris and the Palanpuris, once the compositional change in the industry is controlled for with firm fixed effects. Using export data made available by the GJEPC over an eleven-year period for most of the firms in the sample, I was able to successfully verify both predictions described above, allowing me to rule out alternative non-network based explanations for the patterns in Figure 1.

How did the Kathiawari network grow so strong? The basic marriage rule in Indian society is that no individual can match outside the sub-caste or jati. The dense web of marriage ties that consequently formed over the course of many generations improved information flows and reduced commitment problems, allowing networks serving many different functions to be organized at the level of the jati. While most Indian marriages continue to take place within the jati, intra-industry marriage is an additional mechanism through which industry specific networks can strengthen. Marriage within the industry (and within the jati) reduces the entrepreneur’s incentive to renege on his business obligations, increasing the level of cooperation that
can be sustained by the network in equilibrium. My work shows theoretically that individuals from communities with poor options outside the industry will display the greatest propensity to invest in their industry-specific network and consistent with this prediction we see in Figure 2 that network strengthening intra-industry marriage increases most steeply over time among the Kathiawaris.

Do we expect the experience of the diamond industry to be replicated in other industries and other developing economies? Prior to entering the diamond business the Kathiawaris had an undistinguished history, working as agricultural laborers for centuries and more recently as industrial workers. They simply had the good fortune to be working in a dynamic industry where a confluence of favorable circumstances generated a demand for new entrepreneurs. I attribute the rapid growth of the Kathiawari network to their poor outside options, but it is important to recognize that communities with poor outside options will typically lack business skills, dampening entry into business and with it the growth of their networks. For the Kathiawaris, the first of these opposing effects clearly dominated, but in general whether community networks will crystallize and subsequently grow in dynamic industries is an empirical question. What the analysis in this paper tells us is that one community did expand its activities from agriculture and industrial labor to international business over a single generation in one important industry, and there is no reason why this experience will not be repeated in other settings when circumstances are favorable.

The conference was a spirited affair celebrating Tony’s many contributions to the field. In attendance was a high quality group of colleagues and students, many of whom presented papers. As might be expected given Tony’s longstanding interest in both theoretical econometrics and the application of econometric methods to real world problems the topics were both theoretical and applied: for example, one former student Guido Imbens from Harvard presented a paper on “Discrete Choice Models with Multiple Unobserved Choice Characteristics” while another, Wilbert van der Klaauw from UNC, spoke on “The Impact of Social and Economic Policy on the Family Structure Experiences of Children in the United States”. The highlight of the conference was clearly the conference dinner where Tony (pictured), who has been ill, held forth on a variety of issues and clearly enjoyed interacting with many friends and colleagues from the past and present.

The conference was supported in part through donations in Tony’s honor as well as discretionary funds provided to the department by President Simmons. Details on Tony and the conference may be found at the festschrift web page: http://cemmap.ifs.org.uk/tl_festschrift.php.