

NBER Reporter

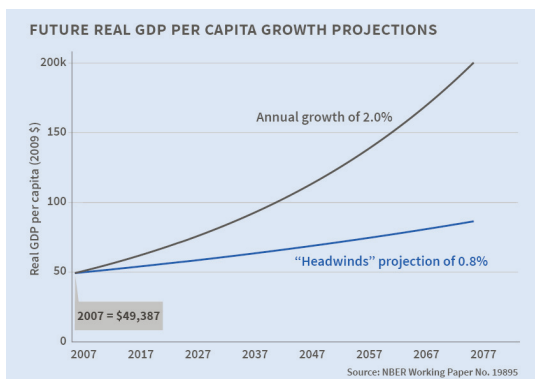
NATIONAL BUREAU OF ECONOMIC RESEARCH

A quarterly summary of NBER research

2015 Number 1

Program Report

ALSO IN THIS ISSUE



Slower U.S. Growth in the Long- and Medium-Run	10
New Perspectives on the First Wave of Globalization	13
Pricing and Marketing Household Financial Services in Developing Countries	17
Assessing the Effects of Monetary and Fiscal Policy	22
2014 Awards and Honors	26
Conferences	28
Program and Working Group Meetings	29
Bureau Books	34

Health Economics

Michael Grossman *

The NBER Program in Health Economics focuses on the determinants and consequences of differences in health outcomes. Program members have continued their long-standing interests in such basic determinants of health as substance use, obesity, and formal schooling, but a substantial number have also diversified their portfolios to include the effects of the business cycle, pollution, and overseas military deployment on health outcomes. During the five-year period covered by this report (2010–14), researchers in the program issued 530 working papers, a 36 percent increase relative to the previous five years.

I begin this report by describing research on these new topics, and then turn to those in areas in which the program has a longer history. Given the many working papers that have appeared in the period covered by my report, I can summarize only a small number of them.

The Great Recession and Health

Studies conducted by Christopher Ruhm and others prior to the Great Recession tended to find that health improved during a recession. In a 1996 study, Ruhm pointed to such contributing factors as increases in the amount of time available to exercise, cook at home, and schedule physician visits due to unemployment; less income to purchase cigarettes, alcohol, and junk food; reductions in fatal motor vehicle accidents due to declines in driving; less job-related stress; reductions in pollution associated with lower levels of industrial activity, and expansions in health insurance coverage as low-wage workers who lose their jobs and lack employer-provided health insurance become eligible for Medicaid.¹ He found that a 1 percentage point rise in unemployment led to a 0.5 percent decline in the death rate. Based on these results and similar ones in other studies, Mark L. Egan, Casey B. Mulligan, and Tomas J. Philipson argue

* Grossman directs the NBER's Program in Health Economics and is Distinguished Professor of Economics at the City University of New York Graduate Center.

NBER Reporter

The National Bureau of Economic Research is a private, nonprofit research organization founded in 1920 and devoted to objective quantitative analysis of the American economy. Its officers and board of directors are:

President and Chief Executive Officer — *James M. Poterba*
Controller — *Kelly Horak*
Corporate Secretary — *Alterra Milone*

BOARD OF DIRECTORS

Chairman — *Martin B. Zimmerman*
Vice Chairman — *Karen N. Horn*
Treasurer — *Robert Mednick*

DIRECTORS AT LARGE

Peter Aldrich	Mohamed El-Erian	Michael H. Moskow
Elizabeth E. Bailey	Linda Ewing	Alicia H. Munnell
John H. Biggs	Jacob A. Frenkel	Robert T. Parry
John S. Clarkeson	Judith M. Gueron	James M. Poterba
Don R. Conlan	Robert S. Hamada	John S. Reed
Kathleen B. Cooper	Peter Blair Henry	Marina v. N. Whitman
Charles H. Dallara	Karen N. Horn	Martin B. Zimmerman
George C. Eads	John Lipsky	
Jessica P. Einhorn	Laurence H. Meyer	

DIRECTORS BY UNIVERSITY APPOINTMENT

Jagdish Bhagwati, <i>Columbia</i>	Benjamin Hermalin, <i>California, Berkeley</i>
Timothy Bresnahan, <i>Stanford</i>	Marjorie B. McElroy, <i>Duke</i>
Alan V. Deardorff, <i>Michigan</i>	Joel Mokyr, <i>Northwestern</i>
Ray C. Fair, <i>Yale</i>	Andrew Postlewaite, <i>Pennsylvania</i>
Edward Foster, <i>Minnesota</i>	Cecilia Elena Rouse, <i>Princeton</i>
John P. Gould, <i>Chicago</i>	Richard L. Schmalensee, <i>MIT</i>
Mark Grinblatt, <i>California, Los Angeles</i>	David B. Yoffie, <i>Harvard</i>
Bruce Hansen, <i>Wisconsin</i>	

DIRECTORS BY APPOINTMENT OF OTHER ORGANIZATIONS

Jean Paul Chavas, *Agricultural and Applied Economics Association*
Martin Gruber, *American Finance Association*
Ellen Hughes-Cromwick, *National Association for Business Economics*
Arthur Kennickell, *American Statistical Association*
William W. Lewis, *Committee for Economic Development*
Robert Mednick, *American Institute of Certified Public Accountants*
Alan L. Olmstead, *Economic History Association*
Peter L. Rousseau, *American Economic Association*
Gregor W. Smith, *Canadian Economics Association*
William Spriggs, *American Federation of Labor and Congress of Industrial Organizations*
Bart van Ark, *The Conference Board*

The NBER depends on funding from individuals, corporations, and private foundations to maintain its independence and its flexibility in choosing its research activities. Inquiries concerning contributions may be addressed to James M. Poterba, President & CEO, NBER, 1050 Massachusetts Avenue, Cambridge, MA 02138-5398. All contributions to the NBER are tax deductible.

The *Reporter* is issued for informational purposes and has not been reviewed by the Board of Directors of the NBER. It is not copyrighted and can be freely reproduced with appropriate attribution of source. Please provide the NBER's Public Information Department with copies of anything reproduced.

Requests for subscriptions, changes of address, and cancellations should be sent to *Reporter*, National Bureau of Economic Research, Inc., 1050 Massachusetts Avenue, Cambridge, MA 02138-5398 (please include the current mailing label), or by email to subs@nber.org. Print copies of the *Reporter* are only mailed to subscribers in the U.S. and Canada; those in other nations may request electronic subscriptions at www.nber.org/drsunsubscribe/.

that since gross domestic product excludes the value of leisure and the value of health, it overstates the severity of recessions.²

A much less rosy picture emerges from research that includes the Great Recession. Using more recent data than that contained in his 1996 study, Ruhm finds that total mortality has shifted over time from being strongly procyclical to being unrelated to macroeconomic conditions.³ This reflects changes in the behavior of specific causes of death. Fatalities due to cardiovascular disease and motor vehicle accidents continue to be procyclical, while deaths due to cancer and accidental poisonings have become countercyclical. The changing effect of macroeconomic conditions on cancer deaths may be due to the increasing protective effectiveness of financial resources, which can be used to fund sophisticated and expensive treatment that has become available in recent years. The behavior of accidental poisoning deaths may have occurred because declines in mental health during economic downturns are increasingly associated with the use of prescribed or illicitly obtained medications that carry risks of fatal overdoses.

Gregory Colman and Dhaval Dave present results that buttress Ruhm's findings.⁴ They show that while becoming unemployed is associated with a small increase in leisure-time exercise, there is a substantial decline in total physical activity. They attribute this to a disproportionate loss of jobs in manual labor, such as construction, during the Great Recession. Hence, even if unemployed people exercised more, they were not as physically active as they had been at work. The upshot was that body weight increased. This may result in long-term reductions in health, since weight gains will not necessarily be reversed once employment is regained. Moreover, due to the concentration of low-educated workers in manual jobs, the recent recession may have exacerbated health differentials between high and low socioeconomic status groups.

Janet Currie and Erdal Tekin present evidence that the housing crisis that accompanied the Great Recession led to worse health outcomes.⁵ They find that an increase in the number of housing foreclosures was associated with increases in medical visits for mental health (anxiety and suicide attempts), for preventable conditions (such as hypertension), and for a broad array of physical complaints that are plausibly stress-related. They also find larger effects for African-Americans and Hispanics than for whites, which is consistent with the perception that minorities were hit particularly hard.

All of the studies just mentioned deal with the

United States. Tinna Laufey Ásgeirsdóttir, Hope Corman, Kelly Noonan, Þórhildur Ólafsdóttir, and Nancy E. Reichman show that the health effects of the Great Recession in Iceland may have differed from those in the United States.⁶ They find that the recession led to reductions in all health-compromising behaviors and that it led to reductions in certain health-promoting behaviors but increases in others. Many of these effects were due to the reduction of Iceland's real exchange rate, which increased the real prices of tobacco, alcohol, and fruits—all of which are primarily imported.

Not all the health effects experienced by U.S. citizens during the Great Recession were unfavorable. For example, Sara Markowitz, Erik Nesson, and Joshua Robinson report that reductions in labor market activity were associated with a reduced incidence of flu.⁷ Jason M. Lindo, Jessamyn Schaller, and Benjamin Hansen find that female layoffs reduced child abuse, while male layoffs increased it.⁸ Given the somewhat conflicting evidence, I suspect that program members will continue to pursue research on the effects of recessions on health for a long time.

Pollution and Health

Reductions in health have well-established negative effects on worker productivity. Tom Chang, Joshua S. Graff Zivin, Tal Gross, and Matthew J. Neidell capitalize on this relationship to study one of the effects of outdoor air pollution: its impact on the productivity and health of indoor workers at a pear-packing factory.⁹ They focus on fine particulate matter (PM 2.5), a harmful pollutant that easily penetrates indoor settings. They find that an increase in PM 2.5 outdoors leads to a statistically and economically significant decrease in packing speeds inside the factory, with effects arising at levels well below current air quality standards. In contrast, they find little effect of pollutants that do not travel indoors, such as ozone.

In a related study, Graff Zivin and Neidell exploit a novel panel dataset of daily farm worker output as recorded under piece-rate contracts merged with data on environmental conditions to relate the plausibly exogenous daily variations in ozone with worker productivity.¹⁰ They find robust evi-

dence that ozone levels well below federal air quality standards have a significant impact on productivity. In particular, a 10 parts per billion decrease in ozone concentrations increases worker productivity by 4.2 percent.

Turning to the direct effects of pollution on health, Emmanuelle Lavaine and Neidell examine the effect of energy production on newborn health using a 2010 strike that affected oil refineries in France as a natural experiment.¹¹ They show that significant reduction in sulfur dioxide (SO₂) concentrations caused by the reduction in refining increased birth weight and gestational age of newborns, particularly for those exposed to the strike during the third trimester of pregnancy. Currie, Graff Zivin, Jamie Mullins, and Neidell summarize a good deal of evidence that points to a positive effect of birth weight on such adult outcomes as earnings.¹² Based on that evidence, back-of-the-envelope calculations made by Lavaine and Neidell suggest that a 1 unit decline in SO₂ leads to a 196 million euro increase in lifetime earnings per birth cohort.

In another study dealing with infant health outcomes, Resul Cetur, Tekin, and Aydogan Ulker explore the impact of the widespread adoption of natural gas—a relatively clean, abundant, and highly efficient source of energy—on infant mortality in Turkey.¹³ They report that a 1 percentage point increase in the rate of subscriptions to natural gas services would cause the infant mortality rate to decline by approximately 4 percent. This would translate into 357 infant lives saved in 2011 alone.

Graff Zivin and Neidell emphasize that avoidance behavior is an important component for understanding the difference between the biological and behavioral effects of pollution and for proper welfare computations.¹⁴ That is, the total cost imposed on society by pollution consists of the monetary value of the health reductions and the cost of resources employed to reduce or avoid increases in morbidity and mortality. In the case of avoidance behavior generated by poor water quality, Graff Zivin, Neidell, and Wolfram Schlenker estimate that U.S. consumers spent roughly \$60 million on bottled water in 2005 specifically to avoid health hazards posed by drinking water violations.¹⁵

Health of Returning Veterans

Ryan Edwards examines the socioeconomic well-being and health of veterans who were deployed overseas in Iraq or Afghanistan.¹⁶ Deployment includes service in a combat or war zone, exposure to casualties, or both. He finds that the impacts on current socioeconomic well-being may be relatively small, but the effects on self-reported health are negative and substantial. His results are consistent with a veterans' compensation system that replaces lost earnings but does not necessarily compensate for other harms associated with combat exposure, such as mental health trauma.

Cetur, Joseph J. Sabia, and Tekin examine the effects of recent deployments by focusing on a different health indicator than the one used by Edwards: adverse mental health.¹⁷ Their use of longitudinal data allows them to condition on mental health prior to deployment and a number of other potential confounders. They argue persuasively that deployment assignments are exogenous, not based on individual soldiers' characteristics such as perceived bravery, mental toughness, or family circumstances, but rather on the operational needs of the armed forces. They find that soldiers deployed to combat zones where they engage in frequent firefights or witness allied or civilian deaths are at substantially increased risk of suicidal ideation and post-traumatic stress disorder (PTSD). Their estimates imply lower-bound health care costs of \$1.5 to \$2.7 billion for combat-induced PTSD.

Unhealthy Behaviors

Tobacco use, obesity resulting from overeating and lack of exercise, excessive alcohol consumption, and illegal drug use rank first, second, third, and ninth, respectively, as the leading causes of premature mortality in the United States and most other countries in the developed world. These behaviors also have substantial effects on morbidity and are associated with such other negative outcomes as child abuse, spouse abuse, fires, crime, and risky sexual encounters. John Cawley and Ruhm present an overview of economic approaches to these behaviors that have been developed by program

members and other researchers.¹⁸ They also summarize empirical evidence concerning the effects of prices, taxes, and government-enacted regulations on unhealthy behaviors from studies conducted prior to 2010. Since consumption of the goods at issue in the present has harmful effects on health in the future, the rate at which people discount the future consequences of their current actions is an important determinant of the consumption of these substances. The greater the rate of time preference for the present, the more likely it is that a person will consume goods that are harmful to his or her health.

Cawley and Ruhm point out that the time discount factor can vary among consumption choices. For example, individuals may heavily discount the harmful effects of eating junk food, while they give much more weight to the harmful effects of cigarette smoking. Henry Saffer pursues this insight by employing a novel empirical approach to create a single measure of self-regulation (a concept that is closely related to time preference) that can vary across domains.¹⁹ This approach allows for the study of how self-regulation is correlated across different health choices. The results show that there is a high correlation in self-regulation for smoking, drinking, drug use, and crime. However, self-regulation for body mass index (BMI, defined as weight in kilograms divided by height in meters squared) and for obesity (BMI equal to or greater than 30) is different than self-regulation for the other outcomes. The results also show that self-regulation has a significant negative effect on all choices.

Tobacco

Program members have continued to collect evidence on the relative effectiveness of tobacco excise tax hikes on the use of tobacco products and related outcomes. Jidong Huang and Frank J. Chaloupka IV examine the impact of the 2009 federal tobacco excise tax increase on the use of cigarettes and smokeless tobacco products among youths ages 14–18.²⁰ The results of this analysis show that this tax increase had a substantial short-term impact. The percentage of students who reported smoking in the

past 30 days dropped between 10 and 13 percent, and the percentage of students who reported using smokeless tobacco products dropped between 16 and 24 percent.

The long-term projected number of youths prevented from smoking or using smokeless tobacco that resulted from the 2009 federal tax increase could be much larger, since the higher tobacco prices would deter more and more children from

RISKY BEHAVIOR

deaths related to modifiable risk factors (2000)

Cause	Deaths (% of total)
Tobacco	435,000 (18%)
Poor diet/inactivity	365,000 (15%)
Alcohol consumption	85,000 (4%)
Microbial agents	75,000 (3%)
Toxic agents	55,000 (2%)
Motor vehicles	43,000 (2%)
Firearms	29,000 (1%)
Sexual behavior	20,000 (1%)
Illicit drug use	17,000 (1%)

Source: Mokdad et al, *Actual Causes of Death in the United States, 2000* (2004) as cited in NBER Working Paper No. 17081

initiating smoking and smokeless tobacco use over time.

Markowitz considers the effects of cigarette excise tax hikes on fires, one of the negative consequences of smoking.²¹ She finds that increases in state excise tax rates on cigarettes are associated with fewer fires. In another study dealing with a negative consequence of smoking, Markowitz, E. Kathleen Adams, Patricia M. Dietz, Viji Kannan, and Van Tong report that higher cigarette taxes are associated with small increases in birth weight and gestational weeks for teenage mothers.²² The mechanism here is that maternal smoking during pregnancy leads to poor birth outcomes.

Kevin Callison and Robert Kaestner question the consensus that raising tobacco taxes reduces cigarette consumption across the board.²³ They find that for adults the association between state tax hikes and either smoking participation or smoking intensity is negative, small, and not statistically significant. These results do not conflict with those that have been observed for teenagers and young adults.

Turning to other determinants of tobacco use, Dave and Saffer provide the first estimates of the effects of magazine advertising on smokeless tobacco (ST) use.²⁴ While the prevalence of ST use is low relative to smoking, the distribution of use is highly skewed, with consumption concentrated among certain segments of the population, such as rural residents, males, whites, and low-educated individuals. Furthermore, there is suggestive evidence that use has trended upwards recently for groups that traditionally have been at low risk of using ST. Dave and Saffer’s focus on magazine advertising is significant given that tobacco manufacturers have been banned from using other conventional media for many years. They find consistent and robust evidence that exposure to ST ads in magazines raises ST use, especially among males. They also present suggestive evidence that both ST taxes and cigarette taxes reduce ST use, indicating contemporaneous complementarity between these tobacco products. Since ST use is less harmful than cigarette smoking, effects from this study inform the debate on the cost and benefits of ST use and its potential to be a tool in overall reduction of tobacco-related harm.

Restrictions on smoking in public places are the most noticeable non-price tobacco control measures worldwide, yet surprisingly little is known about their effects on exposure to environmental tobacco smoke (ETS), commonly termed second-hand smoke. Using data for Canada, Christopher Carpenter, Sabina Postolek, and Casey Warman found these laws had no effects on smoking but induced large and statistically significant reductions in ETS exposure in public places, especially in bars and restaurants.²⁵ They did not find significant evidence of ETS displacement to private

homes. Their results indicate a potential for substantial health improvements from banning smoking in public places.

Alcohol

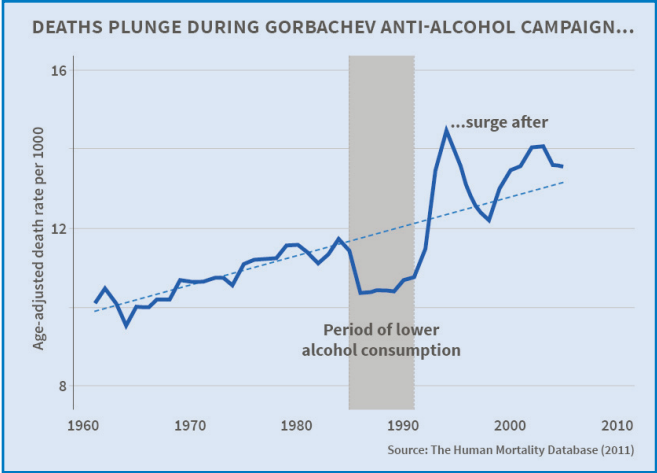
Program members have focused on the effects of alcohol misuse and overuse and on the effects of regulations of these behaviors on motor vehicle accident mortality, other causes of mortality, and crime. Jay Bhattacharya, Christina Gathmann, and Grant Miller show that the end of the 1985–88 Gorbachev Anti-Alcohol Campaign, and not Russia’s transition to capitalism, was responsible for a large part of the 40 percent surge in deaths between 1990 and 1994.²⁶ Philip J. Cook and Christine Piette Durrance report that the 1991 U.S. federal excise tax hikes on beer, wine, and distilled spirits reduced deaths due to crashes and other accidents by approximately 5 percent, or almost 7,000 lives, in that year.²⁷ In addition, the tax increases led to reductions in violent crime and property crime. Hansen finds that increasing punishments and sanctions for repeat drunk-driving offenders and making penalties stiffer the higher the offender’s blood-alcohol content (BAC) are much more effective deterrents than policies to lower the BAC level required for conviction.²⁸ Hope Corman and Naci H. Mocan employ monthly data over 19 years for New York City and after correcting for policy endogeneity find that alcohol consumption is positively related to assault, rape, and larceny crimes but not to murder, robbery, burglary, or motor vehicle theft.²⁹

Illegal Drugs

As a result of the 2012 and 2014 elections, four U.S. states—Alaska, Oregon, Colorado, and Washington—legalized the use of marijuana for recreational purposes. Moreover, laws enacted by an additional 19 states since 1996 have legalized marijuana use for medical purposes. Spurred by these developments, program members have investigated the impacts of these laws on marijuana use, alcohol use, and motor vehicle accident mortality. The laws reduce

the price of marijuana and should lead to an increase in its use. They may reduce the use of alcohol if that substance and marijuana are substitutes, while they may increase the use of alcohol if the two substances are complements. If alcohol and marijuana are substitutes, they also have the potential to reduce motor vehicle accident mortality, because simulator and driver-course studies show that impairments due to alcohol increase the risk of a collision, while impairments due to the use of marijuana do not. Drivers under the influence of marijuana reduce their speed, avoid risky maneuvers, and increase “following distances.” Drivers under the influence of alcohol behave in the opposite manner.³⁰

Program members have taken a 2013



study by D. Mark Anderson, Hansen, and Daniel I. Rees, completed before Hansen became a Faculty Research Fellow in the Health Economics Program, as the point of departure for their research.³¹ Using data from the period from 1990 through 2010, their study finds that use of marijuana rose and alcohol-related traffic fatalities fell by 13 percent in the 13 states that enacted medical marijuana laws during the sample period. At the same time consumption of alcohol, including binge drinking (consumption of five or more drinks of alcohol in a row for males and four or more drinks in a row for females) fell. These findings, which pertain to adults, are consistent with the notion that alcohol and marijuana are substitutes; reductions in the price of marijuana lead to increases in its use and reductions in the use

of alcohol. The authors found no evidence that marijuana use by youths increased. The same authors in a subsequent paper using a larger dataset again find no effect on use by teenagers.³²

Rosalie Liccardo Pacula, Paul Heaton, David Powell, and Eric Sevigny focus on policy differences among states that have adopted medical marijuana laws and analyze the effects of these laws on all outcomes considered in the studies just discussed.³³ These dimensions include whether states require patient registry systems, whether states permit home cultivation, whether states legally allow dispensaries, and whether states make allowance for “pain” rather than only for specific medical conditions. They show that inclusion of these dimensions clouds the sharp results in the studies by Anderson, Hansen, and Rees. Pacula and her colleagues are unable to draw firm conclusions with regard to the effects of the laws on marijuana use, alcohol use, and alcohol-involved fatal crashes.

To complicate the picture even further, Heifei Wen, Jason M. Hockenberry, and Janet R. Cummings employ a dataset not used in previous studies and find that the enactment of medical marijuana laws is associated with an increase in the probability of use by youths and adults.³⁴ Frequency of use and binge drinking increased among adults but not youths. Hopefully, these disparate findings will be better understood as data for longer periods of time become available.

Obesity

Prior research on obesity has focused on body mass index (BMI) as the primary outcome. This is understandable because it is easy to calculate BMI from data on height and weight, both of which are readily available from many social science datasets. The problem with this measure is that it has somewhat limited ability to distinguish body fat from lean body mass. Since it is body fat and not fat-free mass that is responsible for the detrimental effects of obesity, Tekin, Roy Wada, and I use a direct measure of body composition—percentage

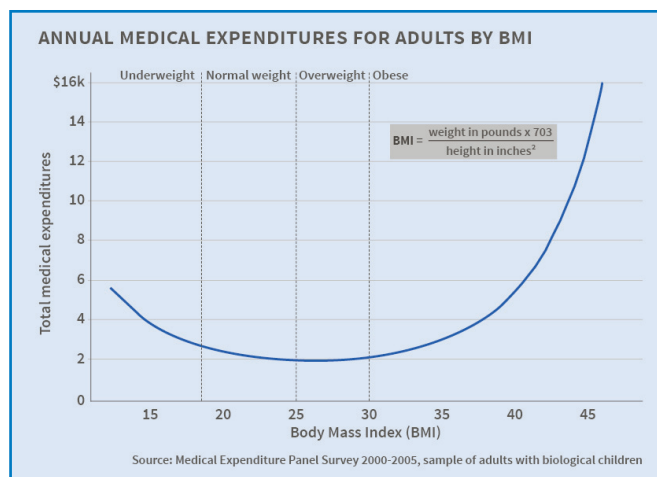
body fat (PBF, defined as body fat as a percentage of total weight)—in a study of the effects of food prices on obesity in youth ages 12 through 18.³⁵ We obtain these measures from bioelectrical impedance analysis or dual energy x-ray absorptiometry conducted during physical examinations, and find that a 10 percent increase in the real price per calorie of food for home consumption lowers PBF by about 9 percent for males and by about 8 percent for females. We also find that an increase in the real price of fast-food restaurant food leads to a reduction in PBF, while a rise in the real price of fruits and vegetables leads to an increase in this outcome. Finally, we show that nonwhite youths are particularly sensitive to fast-food restaurant prices.

An explanation of the last result is that the “full” price of fast-food consumption consists of the money price and the monetary value of the future health consequences of that consumption. A 1 percent change in the money price results in a larger percentage change in the full price when future health costs are small than when they are large. Future costs are likely be less important to parents and youths in the poorer, less-educated families in which a substantial proportion of nonwhite youths reside because these factors are associated with higher rates of time preference for the present. Charles J. Courtemanche, Garth Heutel, and Patrick McAlvanah provide direct evidence in support of the argument just made.³⁶ They find that the body mass index of people around the age of 45 who discount the future heavily based on survey responses is more sensitive to a general measure of the price of food than the body mass index of other consumers.

Tatiana Andreyeva, Inas Rashad Kelly, and Jennifer L. Harris focus on another important determinant of weight outcomes in children—food advertising on television.³⁷ Their results suggest that television advertising for soft drinks and fast food leads to increased consumption of these commodities among elementary school children in the fifth grade. Exposure to 100 incremental TV ads for sugar-sweetened carbonated soft

drinks was associated with a 9 percent rise in children’s consumption of soft drinks. The same increase in exposure to fast-food advertising was associated with a 1 percent rise in children’s consumption of fast food. There was no detectable link between advertising exposure and average body weight, but fast-food advertising was significantly associated with body mass index for overweight and obese children, revealing detectable effects for a vulnerable group.

Turning to one of the important consequences of obesity, Cawley and Chad Meyerhoefer exploit genetic variation in weight as a source of variation and find that weight’s impact on medical costs is approximately 4 times greater than suggested by estimates that do not control for endogeneity.³⁸ They estimate the annual cost of treating obesity in the U.S. at \$168 billion, or 16 per-



cent of national spending on medical care. The upshot is that the previous literature has underestimated the cost effectiveness of anti-obesity interventions.

Schooling and Health

Years of formal schooling completed and health are the two most important components of the stock of human capital, and it is natural to examine complementarities between them. This task is challenging because causality may run both from more schooling to better health and from better health to more schooling. In addition there may be omitted “third variables” that cause both schooling and health to vary in

the same direction. Program members have employed quasi-natural experiments, instrumental variables techniques, temporal ordering, and novel measures of third variables to study this relationship.

Ming-Jen Lin and Elaine M. Liu test the fetal origins hypothesis, namely that *in utero* conditions affect long-run developmental outcomes, using the 1918 influenza pandemic in Taiwan as a natural experiment.³⁹ They find that cohorts *in utero* during the pandemic are shorter as children/adolescents and less educated as adults compared to other birth cohorts. They also find that they are more likely to have serious health problems including kidney disease, circulatory and respiratory problems, and diabetes in old age.

Gabriella Conti and James J. Heckman show that pre-school interventions in low-income populations of U.S. children have positive effects on a variety of measures of well-being in adulthood, including formal schooling completed and health.⁴⁰ They also provide direct evidence in support of the causal effects of education on health in a British panel dataset. Using insights from psychology, they emphasize the “big five personality traits” (conscientiousness, openness, extraversion, agreeableness, and neuroticism) as hard-to-measure factors that influence both health and schooling. Controlling for these measures, cognitive ability, and health, all at age ten, they find that the positive effects of education on self-rated health at age 30, and the negative effects of this variable on smoking and obesity at that age are positively associated with cognitive ability and negatively associated with noncognitive ability.

Damon Clark and Heather Royer exploit changes in British compulsory schooling laws that generated sharp differences in educational attainment among cohorts born months apart to evaluate the causal impacts of education on adult mortality and health behaviors.⁴¹ Kasey Buckles, Andreas Hagemann, Ofer Malamud, Melinda S. Morrill, and Abigail K. Wozniak pursue a similar instrumental variable strategy but with a different instrument—col-

lege completion induced by draft avoidance behavior during the Vietnam War.⁴² Results in the two studies are very different. Clark and Royer find no evidence that increased schooling improved health outcomes or changed health behaviors, while Buckles and colleagues find that college completion reduced cumulative mortality from 1980–2007 by almost 30 percent relative to the mean for men ages 38–49 in 1980. They also report negative effects of college completion on smoking, heavy drinking, and obesity, and a positive effect on exercise.

Health Insurance and Health

Much of the research of the program focuses on the non-medical care determinants of health and the response of those determinants to economic factors. Some investigators, however, consider the effects of medical care and its key determinant—health insurance.

Courtemanche and Daniela Zapata present evidence that the health care reform legislation enacted by Massachusetts and designed to achieve nearly universal coverage led to better overall self-assessed health.⁴³ They also document improvements in several determinants of overall health: physical health, mental health, functional limitations, joint disorders, and body mass index. Finally, they show that the effects on overall health were strongest among those with low incomes, nonwhites, near-elderly adults, and women.

Kaestner, Cuiping Long, and G. Caleb Alexander examine whether obtaining prescription drug insurance through the Medicare Part D program affected hospital admissions, expenditures associated with those admissions, and mortality.⁴⁴ They use a large, geographically diverse sample of Medicare beneficiaries and exploit the natural experiment of Medicare Part D to obtain estimates of the effect of prescription drug insurance on hospitalizations and mortality. Results indicate that obtaining prescription drug insurance through Medicare Part D was associated with an 8 percent decrease in the number of hospital admissions, a 7 percent decrease in Medicare expenditures, and a decrease in total resource use. Gaining prescription drug insurance through Medicare

Part D was not, however, significantly associated with mortality.

Infant and Child Health

The program has had a longstanding interest in the determinants of infant and child health outcomes. Since unplanned pregnancies and births compromise both outcomes, reproductive behavior is one of the most important of these determinants. Three studies have examined the causal impact of women’s schooling on their knowledge and use of contraception. Mabel Andalón, Jenny Williams, and I investigate this issue using information on women in Mexico.⁴⁵ In order to identify the causal effect of schooling, we exploit temporal and geographic variation in the number of lower secondary schools built following the extension of compulsory education in Mexico from 6th to 9th grade in 1993. We show that raising females’ schooling beyond the 6th grade increases their knowledge of contraception during their reproductive years and increases their propensity to use contraception at sexual debut. Mehmet Alper Dinçer, Neeraj Kaushal, and I adopt the same research design to construct an instrument from the 1997 increase in compulsory schooling in Turkey and obtain similar results.⁴⁶ Mocan and Colin Cannonier show that the increase in women’s schooling caused by expanded access to free primary education in Sierra Leone, which occurred between 2001 and 2005 and varied across areas of the country, resulted in a greater propensity to use modern contraception and to be tested for AIDS.⁴⁷ Expansion of education also caused reductions in pregnancies and family size in Turkey and in desired family size in Sierra Leone. Improvements in infant health typically accompany the developments just documented.

In three studies, Theodore J. Joyce and colleagues focus on policy initiatives and regulations that impact abortion—an obvious mechanism to check unplanned births. Silvie Colman and Joyce show that Texas’s Women’s Right to Know Act, which went into effect in January 2004 and requires that all abortions at 16 weeks gestation or later be performed in an ambulatory surgical center, reduced the in-state late-term abor-

tion rate for 2006 by 50 percent below its pre-Act level.⁴⁸ In a second study, Colman, Thomas S. Dee, and Joyce show that parental involvement laws, which require that physicians notify or obtain consent from a parent of a minor seeking an abortion before performing the procedure, have no effects on the rates of sexually transmitted infections or measures of risky sexual behaviors.⁴⁹ In a third study, Joyce, Ruoding Tan, and Yuxiu Zhang use unique data on abortions performed in New York State from 1971 to 1975 to demonstrate that women traveled hundreds of miles for a legal abortion before the Supreme Court decision in *Roe v. Wade* that legalized abortion in all states.⁵⁰ A 100-mile increase in distance for women who live approximately 800 miles from New York was associated with a decline in abortion rates of 3 percent. They also found a positive and robust association between distance to the nearest abortion provider and teen birth rates, but less-consistent estimates for other ages. Their results suggest that even if some states lost all abortion providers due to legislative policies, the impact on aggregate birth and abortion rates would be small, as most women would travel to states with abortion services.

Turning finally to studies that consider the determinants of infant and child health, Mocan, Christian Raschke, and Bulent Unel use skill-based technology shocks as an instrument to show that an increase in weekly earnings of low-skill mothers prompts an increase in prenatal care and has a small positive effect on the birth weight and gestational age of these mothers’ newborns.⁵¹ Clive Belfield and Kelly report that breastfeeding at birth raises the probability that infants will be in excellent health at nine months, and is protective against obesity at 24 and 54 months.⁵² Brian A. Jacob, Jens Ludwig, and Douglas L. Miller focus on mortality between the ages of one and 18 and demonstrate that children who resided in low-income families in Chicago who were offered a housing voucher to move to better neighborhoods had much lower rates of mortality than those in matched families who were not offered the voucher.⁵³

¹ C. J. Ruhm, “Are Recessions Good for Your Health?” NBER Working Paper No. 5570,

May 1996, and the Quarterly Journal of Economics, 115(2), 2000, pp. 617–50. [Return to text.](#)

² M. L. Egan, C. B. Mulligan, and T. J. Philipson, “Adjusting National Accounting for Health: Is the Business Cycle Countercyclical?” NBER Working Paper No. [19058](#), May 2013. [Return to text.](#)

³ C. J. Ruhm, “Recessions, Healthy No More?” NBER Working Paper No. [19287](#), August 2013. [Return to text.](#)

⁴ G. Colman and D. M. Dave, “Unemployment and Health Behaviors Over the Business Cycle: a Longitudinal View,” NBER Working Paper No. [20748](#), December 2014. [Return to text.](#)

⁵ J. Currie and E. Tekin, “Is there a Link Between Foreclosure and Health?” NBER Working Paper No. [17310](#), August 2011, and the American Economic Journal: Economic Policy, 7(1), 2015, pp.63-94. [Return to text.](#)

⁶ T. L. Ásgeirsdóttir, H. Corman, K. Noonan, Þ. Ólafsdóttir, and N. E. Reichman, “Are Recessions Good for Your Health Behaviors? Impacts of the Economic Crisis in Iceland,” NBER Working Paper No. [18233](#), July 2012. [Return to text.](#)

⁷ S. Markowitz, E. Nesson, and J. Robinson, “Are Pink Slips Better Than Flu Shots? The Effects of Employment on Influenza Rates,” NBER Working Paper No. [15796](#), March 2010. [Return to text.](#)

⁸ J. M. Lindo, J. Schaller, and B. Hansen, “Economic Conditions and Child Abuse,” NBER Working Paper No. [18994](#), April 2013. [Return to text.](#)

⁹ T. Chang, J. S. Graff Zivin, T. Gross, and M. J. Neidell, “Particulate Pollution and the Productivity of Pear Packers,” NBER Working Paper No. [19944](#), February 2014. [Return to text.](#)

¹⁰ J. S. Graff Zivin and M. J. Neidell, “The Impact of Pollution on Worker Productivity,” NBER Working Paper No. [17004](#), April 2011, and the American Economic Review, 102(7), 2012, pp. 3652–73. [Return to text.](#)

¹¹ E. Lavaine and M. J. Neidell, “Energy Production and Health Externalities:

Evidence from Oil Refinery Strikes in France,” NBER Working Paper No. [18974](#), April 2013. [Return to text.](#)

¹² J. Currie, J. S. Graff Zivin, J. Mullins, and M. J. Neidell, “What Do We Know About Short and Long Term Effects of Early Life Exposure to Pollution?” NBER Working Paper No. [19571](#), October 2013, and the Annual Review of Resource Economics, 6(1), 2014, pp. 217–47. [Return to text.](#)

¹³ R. Cesur, E. Tekin, and A. Ulker, “Air Pollution and Infant Mortality: Evidence from the Expansion of Natural Gas Infrastructure,” NBER Working Paper No. [18736](#), January 2013. [Return to text.](#)

¹⁴ J. S. Graff Zivin and M. Neidell, “Environment, Health, and Human Capital,” NBER Working Paper No. [18935](#), April 2013. [Return to text.](#)

¹⁵ J. S. Graff Zivin, M. Neidell, and W. Schlenker, “Water Quality Violations and Avoidance Behavior: Evidence from Bottled Water Consumption,” NBER Working Paper No. [16695](#), January 2011, and the American Economic Review, 101(3), 2011, pp. 448–53. [Return to text.](#)

¹⁶ R. D. Edwards, “Overseas Deployment, Combat Exposure, and Well-Being in the 2010 National Survey of Veterans,” NBER Working Paper No. [18227](#), July 2012. [Return to text.](#)

¹⁷ R. Cesur, J. J. Sabia, and E. Tekin, “The Psychological Costs of War: Military Combat and Mental Health,” NBER Working Paper No. [16927](#), April 2011, and the Journal of Health Economics, 32(1), 2013, pp. 51–65. [Return to text.](#)

¹⁸ J. Cawley and C. Ruhm, “The Economics of Risky Health Behaviors,” NBER Working Paper No. [17081](#), May 2011, and in P. P. Barros, T. McGuire, and M. Pauly, eds., Handbook of Health Economics, Volume 2, Amsterdam, The Netherlands: Elsevier, North Holland, 2012, pp. 95–199. [Return to text.](#)

¹⁹ H. Saffer, “Self-regulation and Health,” NBER Working Paper No. [20483](#), September 2014. [Return to text.](#)

²⁰ J. Huang and F. J. Chaloupka, IV, “The Impact of the 2009 Federal Tobacco Excise

Tax Increase on Youth Tobacco Use,” NBER Working Paper No. [18026](#), April 2012. [Return to text.](#)

²¹ S. Markowitz, “Where There’s Smoking, There’s Fire: The Effects of Smoking Policies on the Incidence of Fires in the United States,” NBER Working Paper No. [16625](#), December 2010. [Return to text.](#)

²² S. Markowitz, E. Kathleen Adams, P. M. Dietz, V. Kannan, and V. Tong, “Smoking Policies and Birth Outcomes: Estimates From a New Era,” NBER Working Paper No. [17160](#), June 2011. [Return to text.](#)

²³ K. Callison and R. Kaestner, “Do Higher Tobacco Taxes Reduce Adult Smoking? New Evidence of the Effect of Recent Cigarette Tax Increases on Adult Smoking,” NBER Working Paper No. [18326](#), August 2012, and Economic Inquiry, 52(1), 2013, pp. 155–72. [Return to text.](#)

²⁴ D. M. Dave and H. Saffer, “Demand for Smokeless Tobacco: Role of Magazine Advertising,” NBER Working Paper No. [18003](#), April 2012, and the Journal of Health Economics, 32(4), 2013, pp. 682–97. [Return to text.](#)

²⁵ C. Carpenter, S. Postolek, and C. Warman, “Public-Place Smoking Laws and Exposure to Environmental Tobacco Smoke (ETS),” NBER Working Paper No. [15849](#), March 2010, and the American Economic Journal: Economic Policy, 3(3) August, 2011, pp. 35–61. [Return to text.](#)

²⁶ J. Bhattacharya, C. Gathmann, and G. Miller, “The Gorbachev Anti-Alcohol Campaign and Russia’s Mortality Crisis,” NBER Working Paper No. [18589](#), December 2012, and the American Economic Journal: Applied Economics, 5(2), 2013, pp. 232–60. [Return to text.](#)

²⁷ P. J. Cook and C. Piette Durrance, “The Virtuous Tax: Lifesaving and Crime-Prevention Effects of the 1991 Federal Alcohol-Tax Increase,” NBER Working Paper No. [17709](#), December 2011, and the Journal of Health Economics, 32(1), 2013, pp. 261–67. [Return to text.](#)

²⁸ B. Hansen, “Punishment and Deterrence: Evidence from Drunk Driving,” NBER Working Paper No. [20243](#), June 2014, and the American Economic Review, forthcoming. [Return to text.](#)

²⁹ H. Corman and N. H. Mocan, “Alcohol Consumption, Deterrence, and Crime in New York City,” NBER Working Paper No. [18731](#), January 2013. [Return to text.](#)

³⁰ O. E. Kelly, S. Darke, and J. Ross, “A Review of Drug Use and Driving: Epidemiology, Impairment, Risk Factors, and Risk Perceptions,” Drug and Alcohol Review, 23(3), 2004, pp. 319–44; R. A. Sewell, J. Poling, and M. Sofuoglu, “The Effect of Cannabis Compared with Alcohol on Driving,” American Journal on Addictions, 18(3), 2009, pp. 185–93. [Return to text.](#)

³¹ D. M. Anderson, B. Hansen, and D. I. Rees, “Medical Marijuana Laws, Traffic Fatalities, and Alcohol Consumption,” Journal of Law and Economics, 56(2), 2013, pp. 333–69. [Return to text.](#)

³² D. M. Anderson, B. Hansen, and D. I. Rees, “Medical Marijuana Laws and Teen Marijuana Use,” NBER Working Paper No. [20332](#), July 2014. [Return to text.](#)

³³ R. L. Pacula, D. Powell, P. Heaton, and E. L. Sevigny, “Assessing the Effects of Medical Marijuana Laws on Marijuana and Alcohol Use: The Devil is in the Details,” NBER Working Paper No. [19302](#), August 2013. [Return to text.](#)

³⁴ H. Wen, J. Hockenberry, and J. R. Cummings, “The Effect of Medical Marijuana Laws on Marijuana, Alcohol, and Hard Drug Use,” NBER Working Paper No. [20085](#), May 2014, and the Journal of Health Economics, forthcoming. [Return to text.](#)

³⁵ M. Grossman, E. Tekin, and R. Wada, “Food Prices and Body Fatness among Youths,” NBER Working Paper No. [19143](#), June 2013, and Economics & Human Biology, 12(January), 2014, pp. 4–19. [Return to text.](#)

³⁶ C. J. Courtemanche, G. Heutel, P. McAlvanah, “Impatience, Incentives, and Obesity,” NBER Working Paper No. [17483](#), October 2011, and the Economic Journal, forthcoming. [Return to text.](#)

³⁷ T. Andreyeva, I. R. Kelly, and J. L. Harris, “Exposure to Food Advertising On Television: Associations With Children’s Fast Food and Soft Drink Consumption and Obesity,”

NBER Working Paper No. [16858](#), March 2011, and Economics and Human Biology, 9(3), 2011, pp. 221–33. [Return to text.](#)

³⁸ J. Cawley, C. Meyerhoefer, “The Medical Care Costs of Obesity: An Instrumental Variables Approach,” NBER Working Paper No. [16467](#), October 2010, and the Journal of Health Economics, 31(1), 2012, pp. 219–30. [Return to text.](#)

³⁹ M.-J. Lin and E. M. Liu, “Does in utero Exposure to Illness Matter? The 1918 Influenza Epidemic in Taiwan as a Natural Experiment,” NBER Working Paper No. [20166](#), May 2014, and the Journal of Health Economics, 37, September 2014, pp. 152–63. [Return to text.](#)

⁴⁰ G. Conti and J. J. Heckman, “The Developmental Approach to Child and Adult Health,” NBER Working Paper No. [18664](#), December 2012. [Return to text.](#)

⁴¹ D. Clark and H. Royer, “The Effect of Education on Adult Health and Mortality: Evidence from Britain,” NBER Working Paper No. [16013](#), May 2010, and the American Economic Review, 106(6), 2013, pp. 2087–2120. [Return to text.](#)

⁴² K. Buckles, A. Hagemann, O. Malamud, M. S. Morrill, and A. K. Wozniak, “The Effect of College Education on Health,” NBER Working Paper No. [19222](#), July 2013. [Return to text.](#)

⁴³ C. J. Courtemanche, D. Zapata, “Does Universal Coverage Improve Health? The Massachusetts Experience,” NBER Working Paper No. [17893](#), March 2012, and the Journal of Policy Analysis and Management, 33(1), 2014, pp. 36–69. [Return to text.](#)

⁴⁴ R. Kaestner, C. Long, G. C. Alexander, “Effects of Prescription Drug Insurance on Hospitalization and Mortality: Evidence from Medicare Part D,” NBER Working Paper No. [19948](#), February 2014. [Return to text.](#)

⁴⁵ M. Andalón, J. Williams, and M. Grossman, “Empowering Women: The Effect of Schooling on Young Women’s Knowledge and Use of Contraception,” NBER Working Paper No. [19961](#), March 2014. [Return to text.](#)

⁴⁶ M. A. Dinçer, N. Kaushal, and M. Grossman, “Women’s Education: Harbinger of Another Spring? Evidence from a Natural Experiment in Turkey,” NBER Working Paper No. [19597](#), October 2013, and World Development, 64(December), 2014, pp. 243–58. [Return to text.](#)

⁴⁷ N. H. Mocan and C. Cannonier, “Empowering Women Through Education: Evidence from Sierra Leone,” NBER Working Paper No. [18016](#), April 2012. [Return to text.](#)

⁴⁸ S. Colman and T. J. Joyce, “Regulating Abortion: Impact on Patients and Providers in Texas,” NBER Working Paper No. [15825](#), March 2010, and the Journal of Policy Analysis and Management, 30(4), 2011, pp. 775–97. [Return to text.](#)

⁴⁹ S. Colman, T. S. Dee, and T. J. Joyce, “Do Parental Involvement Laws Deter Risky Teen Sex?” NBER Working Paper No. [18810](#), February 2013, and the Journal of Health Economics, 32(5), 2013, pp. 873–80. [Return to text.](#)

⁵⁰ T. J. Joyce, R. Tan, and Y. Zhang, “Back to the Future? Abortion Before & After Roe,” NBER Working Paper No. [18338](#), August 2012, and as “Abortion Before and After Roe,” Journal of Health Economics, 32(3), 2013, pp. 804–15. [Return to text.](#)

⁵¹ N. Mocan, C. Raschke, and B. Unel, “The Impact of Mothers’ Earnings on Health Inputs and Infant Health,” NBER Working Paper No. [19434](#), September 2013. [Return to text.](#)

⁵² C. R. Belfield and I. R. Kelly, “The Benefits of Breastfeeding Across the Early Years of Childhood,” NBER Working Paper No. [16496](#), October 2010, and the Journal of Human Capital, 6(3), 2012, pp. 251–77. [Return to text.](#)

⁵³ B. A. Jacob, J. Ludwig, and D. L. Miller, “The Effects of Housing and Neighborhood Conditions on Child Mortality,” NBER Working Paper No. [17369](#), August 2011, and the Journal of Health Economics, 32(1), 2013, pp. 195–206. [Return to text.](#)



Initially appointed in 1968, Robert J. Gordon is one of the NBER's longest-serving research associates. His research program affiliations include Economic Fluctuations and Growth, International Finance and Macroeconomics, and Productivity, Innovation, and Entrepreneurship. He has served as a member of the NBER Business Cycle Dating Committee since 1978, and is the Stanley G. Harris Professor in the Social Sciences at Northwestern University.

Gordon's research spans numerous aspects of supply-side macroeconomics. He helped to integrate the analysis of supply shocks into macroeconomics, and his dynamic inflation model explains why inflation can be both positively and negatively correlated with unemployment, depending on the sources of shocks. He has also carried out extensive research on measurement errors in price indices for durable goods, clothing, and housing.

Gordon received his B.A. from Harvard, an M.A. from Oxford on a Marshall Scholarship, and his Ph.D. from MIT. He is a Distinguished Fellow of the American Economic Association and a fellow of both the Econometric Society and the American Academy of Arts and Sciences.

Gordon lives in Evanston, Illinois, with his wife, Julie, and their dog, Toto. He enjoys theater, music, and photography and invites readers to google "[Photos of Economists](#)" for his web gallery of 325 photos of economists dating back to 1967.

Research Summaries

Slower U.S. Growth in the Long- and Medium-Run

Robert J. Gordon

The annual growth rate of U.S. per-capita real GDP remained remarkably steady at 2.1 percent between 1890 and 2007. Until recently, it was widely assumed that the Great Recession of 2007–09 and the slow recovery since 2009 represented only a temporary departure from that steady long-run growth path. Growth theory, which tends to take the economy's underlying rate of technological change as exogenous, was consistent with the widespread expectation that in the long run the economy's growth rate would soon return to the longstanding 2 percent annual rate.

In a series of research papers dating back 15 years, I have questioned the presumption of a constant pace of innovation and technological change. More recently, in several papers I have described a variety of "headwinds" that are in the process of slowing the economy's growth rate independently of the contribution of innovation. Taken together, these headwinds and a slowing pace of innovation lead me to predict that the economy's long-run rate of growth of per-capita real GDP over the next 25 years or so will be 0.9 percent, less than half of the historic pre-2007 rate of 2.1 percent. And that 0.9 percent will not be available to most of the population, as growing inequality will cause a disproportionate share of available output growth to accrue to those whose incomes fall in the top one percent of the income distribution. Growth of per-capita real income for the bottom 99 percent of the income distribution will be 0.5 percent per year or less.

This research summary begins with a look at the factors involving innovation and the headwinds that are in the process of reducing long-run growth. A subsequent section describes a new technique to estimate

the growth rate of the economy's underlying potential output, an analysis which concludes that the economy's potential growth rate falls well short of that currently assumed in the projections of the Congressional Budget Office (CBO).

The Pace of Innovation and the "One Big Wave"

Any treatment of U.S. long-run growth must distinguish between productivity and per-capita output. While these two measures of the growth process are sometimes treated as interchangeable, they are not. The growth rate of output per person equals the growth rate of output per hour plus the growth rate of hours per person. While per-person output growth was relatively steady over the entire period between 1890 and 2007, growth of output per hour and of hours per person were not. In particular, labor productivity experienced a half-century of rapid growth between 1920 and 1970, then slowed markedly after 1970. This productivity growth slowdown did not dampen the growth rate of per-person output because the growth of hours per person was bolstered by the entry to women into the labor force.

The basic measure of the pace of innovation in an economy is the growth rate of total factor productivity (TFP), which is calculated by subtracting from labor productivity growth both the contribution of growth in the capital-labor ratio (capital deepening) and the effect of higher educational attainment. Because the capital-deepening and education effects were relatively constant between 1890 and 2007, TFP growth has an even-more-pronounced peak during the half-century 1920–70 than is true for labor

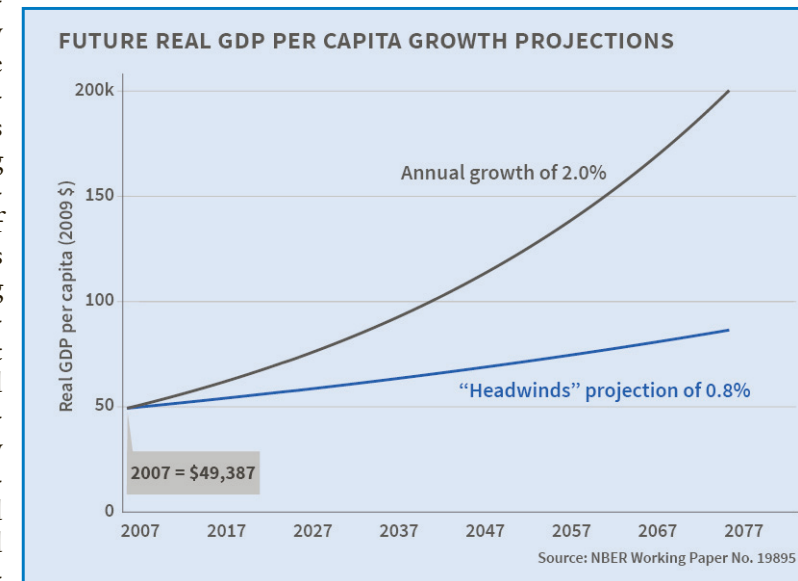
productivity. I have called this peaked time path of TFP the "one big wave" and have provided estimates of TFP growth equal to a rate of 2.03 percent per year during 1920–70 as compared with only 0.7 percent for 1890–1920 and 0.74 percent for 1970–2014.¹

The primary substantive explanation for the big wave lies in the timing of inventions. TFP growth during the 1920–70 big wave benefited from the diffusion of four great clusters of inventions that in their combined importance overshadowed the information and communication technology (ICT) revolution of the last few decades. A complementary hypothesis is that the partial closing of American labor markets to immigration and of American goods markets to imports during the big wave period gave an artificial and temporary boost to real wages which fed back into boosting productivity growth, followed by a reopening of the economy to immigration and imports that contributed to the post-1970 slowdown in growth of TFP and of labor productivity.²

The ICT revolution began with the first mainframe computers in the 1960s and 1970s, but productivity and TFP growth remained slow from 1970 until the mid-1990s. Then the economy enjoyed a temporary revival in productivity and TFP growth that lasted from 1996 to 2004. Any assessment of the likely long-run growth of productivity and TFP over the next 25 years needs to evaluate which is more relevant to the future, the brief 1996–2004 revival period or the other years since 1970 (i.e., 1970–96 and 2004–14) during which productivity and TFP growth have been much slower.

In my recent analyses, I argue that the 1996–2004 revival period is not relevant for future forecasts for two reasons. First, productivity growth during 2004–14 was even slower than during 1970–96, not to mention 1996–2004. Second, several other aspects of

economic performance exhibited a similar pattern of temporary revival that died out after the early 2000s. Manufacturing capacity growth rose from 2.5 percent in 1970–95 to over six percent in 1995–2000, followed by a steady decline to negative growth in 2011–12. The share of ICT value-added in total manufacturing value-added exhibited a similar sharp peak in 1998–2000 followed by much lower values after 2000, and the ratio of price to performance of computer equipment also reached its fastest pace of



decline during the same narrow time span of 1998–2000.³

The "Headwinds" That Are Slowing the Pace of U.S. Economic Growth

The headwinds that are in the process of slowing U.S. economic growth include demography, education, inequality, and the federal debt.⁴ Each of these alters the growth of long-run real output per capita in a different way. The demographic headwind, by reducing hours per person, shrinks the growth rate of real per-person output below the rate of productivity growth. The education headwind directly reduces growth in both productivity and in real output per person. The inequality headwind reduces the growth rate of per-person income in the bottom 99 percent of the income distribution below the average for

all income-earners. The federal debt headwind causes a decline in disposable income relative to total income as a result of cuts in benefits or increases in taxes needed to stabilize the federal debt-GDP ratio.

The first component of the demographic headwind is the slowing rate of population growth due to declining fertility and immigration. While a decline in the rate of population growth has no direct impact on per-person output growth, it does put downward pressure on aggregate demand due to the declining need for net investment in residential housing as well as shopping centers and other types of nonresidential building. The second and more important demographic component is the ongoing shrinkage in aggregate work hours relative to the size of the population, and this in turn is due to the ongoing decline in the labor-force participation rate (LFPR). Retirement of the baby-boom generation causes hours per person to decline at a rate of about 0.4 percent per year. Since 2009, the LFPR has been declining at about 0.8 percent per year, reflecting

declining participation over and above the baby-boom retirement phenomenon. Key groups exhibiting a declining LFPR are adult men in the 25–54 age group and youth of both sexes aged 16 to 24. Any future decline in the LFPR, including the inevitable further contribution of baby-boom retirement to slowing growth in labor hours, reduces the growth rate of output per person relative to output per hour.

The education headwind involves both educational attainment and educational performance. Rising educational attainment between 1910 and 1970, as the high-school completion rate increased from 10 to 80 percent, was an important contributor to productivity growth during the "one big wave" period of 1920–70. The rate of high school completion has changed little in the past four decades. Even though the college completion rate continues to inch up, the U.S. remains the only nation in which the educa-

tional attainment of the 25–34 age cohort is little different than the 55–64 cohort. In all other industrialized countries attainment of the young is substantially greater. An additional issue that will subtract from future productivity growth is the poor quality of educational outcomes in high school. The OECD international Programme for International Student Assessment tests of 15-year-olds reveal that American scores in reading, math, and science rank in the bottom half of the nations tested.

The reduced pace of growth-enhancing innovation after 1970, as well as the demographic and education headwinds, result in projected growth of U.S. real output per person over the next 25 years of 0.9 percent per annum as compared to 2.1 percent per annum during 1890–2007. But this average rate of 0.9 percent does not apply to the great majority of American households because of the inexorable rise of inequality that has occurred since the late 1970s. The inequality data of Thomas Piketty and Emmanuel Saez can be used to calculate that for the 1993–2013 interval the growth rate of income for the bottom 99 percent of the income distribution lagged the overall average by 0.5 percentage points per annum. If this were to continue, it would reduce growth of real income per capita for the bottom 99 percent to 0.4 percent per year, 0.5 percentage points slower than the 0.9 percent average for all income earners. The forces leading to greater income inequality are many and differ for the top one percent and bottom 99 percent of the income distribution, and few of these forces are likely to lose relevance over the next few decades.⁵

The fourth headwind reflects CBO projections that the federal debt-GDP ratio will rise steadily after 2020 as a result of growth in entitlements, mainly Social Security and Medicare. To avoid an unsustainable increase in that ratio, some combination of benefit reductions and tax increases will need to

occur. This will reduce disposable income below the amount that otherwise would be available to fuel growth in per-capita real income.

Output Growth in the Medium Run

When the U.S. unemployment rate fell below 6 percent in late 2014, attention began to shift from short-run demand factors that affected the labor market to longer-term considerations such as the economy's potential output-growth rate that would set a limit on the rate at which actual output could grow once the unemployment rate stabilized at a particular value. I proposed a simple method of calculating the growth rate of potential GDP based on estimates of each component of the "output identity," a definition linking output to productivity, hours per employee, the employment rate, the LFPR, and the size of the population. Based on alternative estimates of productivity growth and the change in the LFPR, I calculated a range of three values for the potential output growth rate. The central prediction of 1.6 percent per annum is much lower than the 2.2 percent annual growth rate currently assumed by the CBO, a difference that implies the CBO has overstated 2024 real GDP by \$2 trillion. Because slower future output growth implies less growth in tax revenues, I calculate that the CBO has understated the 2024 federal debt-GDP ratio by nine percentage points (78 vs. 87 percent).⁶ Slower potential GDP growth adds to the bite of the federal debt headwind by requiring a greater future fiscal retrenchment than would otherwise be necessary.

My estimate of 1.6 percent for the current rate of potential real GDP growth is almost exactly equal to realized actual real GDP growth in 2004–14, implying "more of the same" rather than a radically new economic environment. The 1.6 percent potential growth rate is almost exactly half of the

realized growth rate of actual real GDP between 1972 and 2004; of this difference, roughly one-third is due to slower productivity growth and the other two-thirds to slower growth in aggregate hours of work.

¹ R. J. Gordon, "Interpreting the 'One Big Wave' in U.S. Long-term Productivity Growth," NBER Working Paper No. 7752, June 2000, and in Bart van Ark, Simon Kuipers, and Gerard Kuper, eds., *Productivity, Technology, and Economic Growth*, Boston, MA: Kluwer Publishers, 2000, pp. 19–65.

[Return to text.](#)

² R. J. Gordon, "Does the New Economy Measure Up to the Great Inventions of the Past?" NBER Working Paper No. 7833, August 2000, and *Journal of Economic Perspectives*, 14(4), 2000, pp. 49–74.

[Return to text.](#)

³ R. J. Gordon, "The Demise of U.S. Economic Growth: Restatement, Rebuttal, and Reflections," NBER Working Paper No. 19895, February 2014.

[Return to text.](#)

⁴ The headwinds were introduced in R. J. Gordon "Is U.S. Economic Growth over? Faltering Innovation Confronts the Six Headwinds," NBER Working Paper No. 18315, August 2012.

[Return to text.](#)

⁵ R. J. Gordon and I. Dew-Becker, "Controversies about the Rise of American Inequality: A Survey," NBER Working Paper No. 13982, May 2008, and "Selected Issues in the Rise of Income Inequality," *Brookings Papers on Economic Activity*, 2, 2007, pp. 169–92.

[Return to text.](#)

⁶ R. J. Gordon, "A New Method of Estimating Potential Real GDP Growth: Implications for the Labor Market and the Debt/GDP Ratio," NBER Working Paper No. 20423, September 2014. [Return to text.](#)

New Perspectives on the First Wave of Globalization

Christopher M. Meissner

The first "Great Wave of Globalization," during the late 19th and early 20th centuries, witnessed a historically unprecedented rise in spatial economic integration. Between 1850 and 1913, transportation costs plummeted, information flows accelerated, tariffs fell, trade treaties such as free trade agreements with unconditional most-favored-nation clauses and treaty ports proliferated, and empires expanded. In addition, a set of global financial intermediaries flourished, migrants flowed to previously unsettled regions in unprecedented numbers, and economic and political stability was largely the norm.

Unsurprisingly, many commodity prices converged and the export share of total production increased dramatically, doubling or tripling in many small, open economies between 1850 and 1914. In addition, new markets opened up to international trade and previously unavailable varieties of goods became accessible. Patterns of specialization and production processes were transformed. All of these forces significantly affected the living standards of those participating. Modern economic growth, meaning sustained rises in the standard of living, became the new norm. Social and political transformations also accompanied this episode of great integration.

My research, in collaboration with Michael Huberman, David Jacks, Dan Liu, Dennis Novy, and Kim Oosterlinck, seeks to shed further light on the causes and consequences of the international trade boom between 1870 and 1914. How much did trade costs actually fall in this period of globalization? What fraction of the rise in trade flows can be explained by the decline in trade costs? What was the relative contribution of geography, policy, and technology in explaining the first wave of globalization? What impact did trade costs and trade integration have on welfare and then on institutional and policy outcomes

such as labor standards or the level of democracy?

To help answer these questions we have digitized and compiled a large amount of historical data from national data sources covering bilateral trade flows, GDP, gross production, and many other geographic and policy variables. Comprehensive bilateral trade data were recorded in the 19th century by national authorities and colonial powers, since a large fraction of government revenue came from taxes on international trade. Moreover, as I will detail below, not only can we make use of aggregate bilateral trade data, but economic historians are now able to rely on bilateral, product-level trade flows which provide greater granularity and deeper insight into the mechanics of the first wave of globalization. While research is only just beginning as regards the latter, these data will allow us to gain a greater understanding of forces driving globalization and its connections to economic growth, both in industrial leaders and their followers. Such questions potentially have great relevance today both to developing countries and to leading countries that are being strongly affected by globalization. This brief survey discusses what emerges when we combine these data sets and analyze them with the help of trade theory and modern empirical methods.

Trade Costs and the Determinants of Globalization

Trade costs can be broadly defined as the resource costs of shipping and trading commodities across international borders. When such trade is costly, foreign demand for domestic goods is assumed to be lower than it would be in the absence of such costs. What role did these costs play in explaining the growth of international trade and the types of goods traded during the first globalization? Especially impor-



Christopher M. Meissner is a Research Associate in the NBER's Program on the Development of the American Economy and a professor in the department of economics at the University of California, Davis.

His research interests include measuring international trade integration, the determinants of international trade, and the impact of international trade on policies and institutions. Other research focuses on international capital flows in the first wave of globalization, the origins and consequences of foreign currency debt, and the determinants and consequences of financial crises.

Meissner received his A.B. in economics from Washington University in St. Louis in 1996 and his Ph.D. in economics from the University of California, Berkeley, in 2001. Before joining UC Davis, Meissner was a lecturer in economics at Cambridge University and a fellow of King's College, Cambridge.

Meissner lives in Davis, California, with his wife and four children and also spends a good deal of time in the far north of France, near Lille. Science fiction, foreign films, eating and cooking spicy food, and endless home improvement projects keep him busy when time permits.

tant is understanding how much trade costs mattered relative to other determinants, such as economic growth and comparative advantage.

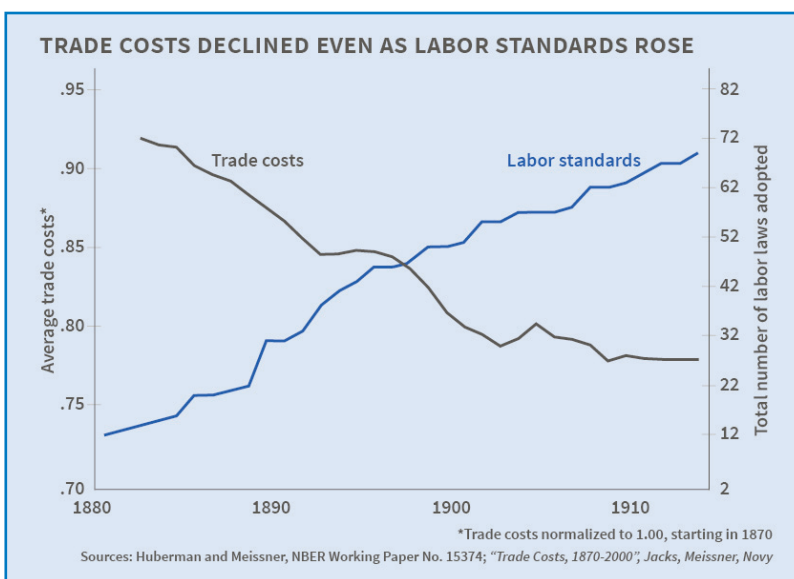
Previous work in economic history has emphasized the rapid decline in transportation costs and the fall in tariffs.¹ However, a number of other trade costs mattered over this period, and not all of them followed the same path as real transportation costs. My collaborators and I have built up a number of historical datasets that allow us to track the evolution and impact over time of trade costs other than transportation and tariffs. For instance, my research with J. Ernesto López-Córdova covering 28 countries between 1870 and 1910 uses a gravity model of bilateral trade flows.² We find that when two nations adopted the gold standard, trade was higher by 15 percent, on average, relative to non-adopters. Monetary unions, political alliances, language, and trade treaties also affected the direction of trade.

Many other factors determine trade costs, and very often these are unob-

servable or impossible to measure in any conventional sense. In this case, a structural approach to trade costs can be taken. Jacks, Novy, and I measure trade costs as the scaled difference between domestic and international trade flows.³ The structural approach provides a measure of trade costs in terms of a tariff equivalent, and it is often referred to as the Head-Ries measure. This measure is quite general and is consistent with nearly all leading theoretical models of trade. Our data for the U.S., U.K., and France and their major trading partners between 1870 and 1913 show that trade costs fell at a rate of about 0.3 percent per year, which is significantly slower than the decline in average maritime freight rates of 2 percent per year. Our explanation for this is, first, that

our all-encompassing trade-cost measure captures many other frictions which were slower to decline than freight rates. These include border frictions, legal and cultural barriers to trade, and significant rises in tariffs during the period. Another crucial aspect to highlight is that international integration can only rise when the relative costs of engaging in international trade fall. During this period, the railroad and many other domestic infrastructure projects promoted internal as much as international integration.

We also studied the effects of the



decline in overall trade costs between specific pairs of countries. We analyzed 130 unique country pairs covering approximately 70 percent of global exports and 68 percent of world GDP in the period 1870 to 2000.⁴ Using our methodology, we show how to decompose the growth in trade between two factors: trade-cost changes and economic growth. We find some differences across major countries like the U.S., France, and the U.K. and between different periods. For instance, while trade-cost declines explain about 60 percent of trade growth between 1870 and 1913, they only explain 30 percent in the period 1950–2000. In each period, the remainder of trade growth appears to be coming from economic growth. Thus, while we experienced roughly equal increases in global trade flows during the two waves of glo-

balization, the drivers of growth in overall trade in 1870–1913 and in 1950–2000 appear to have been quite different.

The Margins of Trade and the First Wave of Globalization

Recently my collaborators and I have begun to use disaggregated historical trade statistics to understand better the underlying dynamics of globalization and its impact on local economies. Using newly digitized bilateral, product-level trade data for Belgium, a typical

industrializing, small, open economy between 1870 and 1913, we illustrate that globalization in the 19th century had a very important “extensive margin.”⁵ While the existing literature on pre-1914 globalization has emphasized a “great specialization,” this characterization fails to take into account that a significant fraction of the growth of trade was due to the export of new goods and the opening up of new markets. Significant amounts of the observed trade flows were also in fact already intra-industry. This observation leads us to believe that then, as now, firm-level heterogeneity and trade costs mattered.

We first decompose the growth of Belgian manufacturing exports into an intensive margin (old products and old countries) and an extensive margin (new goods and new countries). Between 1880 and 1910 about 58 percent of the growth in the value of exports was accounted for by the appearance and growth of exports of new goods. In this case, 45 percent of the growth is attributable to the intensive margin or products that were already being shipped in 1870. A small set of exports was discontinued, acting to reduce trade by about 3 percent less than would otherwise have been the case.

We are also able to track the evolu-

tion and impact of a number of trade costs, some of which acted as “fixed” costs to exporting, and some of which acted as “variable” trade costs. We find evidence that diplomatic representation, colonial ties with other leading nations, and absence of a common language acted to alter the fixed costs of trade, implying that these factors helped generate—or limited, in the case of trade with colonies of the great powers—export success in new goods, such as tramways and other high quality/high value-added manufactures.

We also find other evidence consistent with the idea that firm-level heterogeneity was important in the first period of globalization. Gravity regressions by product or industry reveal a range of elasticities with respect to observable trade costs that depend on the type of good and industry. This is consistent with the predictions of modern models of trade with heterogeneous firms. A final finding is that, as fixed costs fell and presumably as new firms found it profitable to enter export markets, many industries experienced relatively slow productivity growth as low-productivity entrants were now able to survive. This was especially true in older, more-established industries. Although Belgium experienced a rise in productivity, overall productivity growth between 1870 and 1910 was much slower than we would expect in the midst of such an unprecedented trade boom, and it was much lower than productivity growth in the new-goods sectors. Since the former made up for a greater share of total output than the latter, overall productivity growth was muted despite falling trade costs. We ascribe this finding to “negative” selection effects.

The Impact of International Trade: Welfare, Institutions and Policies

Trade costs also directly affected welfare and institutional outcomes of interest in the first wave of globalization.⁶ Market potential, essentially the global demand for a country’s output, is

limited by trade costs and hence by the level of integration. Many studies covering the past few decades have found that higher market potential is strongly related to higher income per person. In this context, Liu and I study the importance of market potential in the late 19th and early 20th centuries.⁷ This work addresses an important and long-running historical debate about how the U.S. overtook Great Britain in productivity leadership in the late 19th century.

The economic history and economic growth literature has often attributed this event to the outsized U.S. domestic market. We find however that theory-based empirical measures of market size (i.e., market potential) for the U.S. are not significantly larger than they were for Great Britain, France, or Germany circa 1900. To be sure, international borders greatly reduced the leading European nations’ trade, such that they faced an effective 60 percent ad valorem-equivalent tariff on their exports. At the same time, their domestic markets were dense and well-connected via water routes and extensive internal infrastructure, including roads, canals and railroads. We conduct a counterfactual simulation within a general equilibrium model of trade and find that had some of the smallest economies of the time (such as Belgium, Canada, Denmark, and Switzerland) been able to sell into global markets without facing international borders, their real per capita incomes could have risen to the levels attained by the U.S.

It is worth asking whether institutional and policy changes in the late 19th century were related to the first wave of globalization. First, observe that, from the middle of the 19th century, many countries dramatically extended the franchise, thereby increasing the level of ostensible democracy. A similar trend coincided with the more-recent wave of globalization, as the number and share of democracies in the world rose dramatically from the 1960s. Open-economy models of institutional change highlight that if trade induces a more-even distribution of income—say, as labor benefits from an increase in global

demand—then greater democracy could result.⁸ We use an instrumental-variables strategy inspired by Jeffrey Frankel and David Romer to see whether, in the first wave of globalization in particular, exposure to trade flows, might have had a causal impact on democracy.⁹ There is little evidence that it did.¹⁰ However, in the late 20th century, we find that there was a statistically significant and positive relationship between these variables that was strengthened when the middle class benefitted from globalization, much as theory predicts.

Like modern economists and policy makers, authorities in the late 19th century wondered whether the technological changes affecting the integration of global markets would lead to intense labor market competition and a race to the bottom in terms of social policy. Bismarck, amongst others in Europe and the U.S., worried that domestic producers would be negatively impacted by radical changes to the social welfare state—such as the child labor laws, limits on working hours, and other labor standards which they were instituting. Despite the pessimism, labor standards were implemented in many countries. Strikingly, the data clearly show that a number of leading countries heavily exposed to international trade vigorously and enthusiastically adopted new labor regulations. Our research shows that country pairs that traded extensively with one another were more likely to adopt the labor standards of their trading partners.¹¹ Evidently, trade can be used as a lever for better social protection, and globalization does not always promote a race to the bottom.

Further Horizons

Recent research using new trade data and theory-based methodology has advanced our understanding of the causes and consequences of the first wave of globalization. Future work will provide new evidence based on recently digitized bilateral, product level trade for the United States, and this should shed further light on the industry-level

growth impact of the first wave of globalization in an important industrializer. Together with similar datasets that are currently being processed by researchers around the world for China, France, Germany, Italy, Japan, Switzerland, and the U.K., a new view, or at least a greatly enhanced vision, of 19th century globalization is sure to emerge. Countries did not compete and grow based only on their factor endowments. Like today, producers and consumers gained from access to new finished and intermediate goods and higher-quality varieties of already existing goods, such that the welfare gains from trade strongly contributed to rises in living standards during the first wave of globalization.

¹ J. Williamson, “Globalization, Convergence and History,” *The Journal of Economic History*, 56(2), 1996, pp. 277–306.

[Return to text.](#)

² J. E. López Córdova and C. M. Meissner, “Exchange Rate Regimes and International Trade: Evidence from the Classical Gold Standard Era, 1870–1913,” *American Economic Review*, 93(1), 2003, pp. 344–53.

[Return to text.](#)

³ D. S. Jacks, C. M. Meissner, and D. Novy “Trade Costs in the First

Wave of Globalization,” *NBER Working Paper No. 12602*, October 2006, and *Explorations in Economic History*, 47(2), 2010, pp. 127–41.

[Return to text.](#)

⁴ D. S. Jacks, C. M. Meissner, and D. Novy “Trade Booms, Trade Busts and Trade Costs,” *NBER Working Paper No. 15267*, August 2009, and *the Journal of International Economics*, 83(2), 2011, pp. 185–201.

[Return to text.](#)

⁵ M. Huberman, C. M. Meissner, and K. Oosterlinck, “Technology and Geography in the Second Industrial Revolution: New Evidence from the Margins of Trade,” *NBER Working Paper No. 20851*, January 2015.

[Return to text.](#)

⁶ For a comprehensive survey of the historical literature on globalization and growth see: C.M. Meissner, “Growth from Globalization? A View from the Very Long-Run,” in P. Aghion and S. N. Durlauf, eds., *Handbook of Economic Growth*, vol. 2B, Oxford, United Kingdom: Elsevier Press, 2014, pp. 1033–69.

[Return to text.](#)

⁷ D. Liu and C.M. Meissner, “Market Potential and the Rise of US Productivity Leadership” *NBER Working Paper No. 18819*, February

[Return to text.](#)

2013, and *the Journal of International Economics*, forthcoming.

[Return to text.](#)

⁸ D. Acemoglu and J. A. Robinson, *Economic Origins of Dictatorship and Democracy*, Cambridge, United Kingdom: Cambridge University Press, 2009.

[Return to text.](#)

⁹ J. A. Frankel and D. Romer, “Does Trade Cause Growth?” *American Economic Review*, 89(3), 1999, pp. 379–99, and “Trade and Growth: An Empirical Investigation,” *NBER Working Paper No. 5476*, March 1996.

[Return to text.](#)

¹⁰ J.E. López Córdova and C.M. Meissner, “The Globalization of Trade and Democracy, 1870–2000,” *NBER Working Paper No. 11117*, February 2005, and *World Politics*, 60(4), 2008, pp. 539–75.

[Return to text.](#)

¹¹ M. Huberman and C. M. Meissner, “Riding the Wave of Trade: Explaining the Rise of Labor Regulation in the Golden Age of Globalization,” *NBER Working Paper No. 15374*, September 2009, and *the Journal of Economic History*, 70(3), 2010, pp. 657–85.

[Return to text.](#)

Pricing and Marketing Household Financial Services in Developing Countries

Dean Karlan and Jonathan Zinman

Retail financial institutions worldwide are facing greater competition and regulatory scrutiny. This makes it increasingly important for them to understand the drivers of consumer demand for basic financial services if they are to maximize profits, improve social impacts, and address public policy concerns. Researchers also need to understand these drivers in order to calibrate, shape, and test models in fields ranging from contract theory to behavioral economics to macroeconomics to basic microeconomics. Likewise, policymakers need to understand these drivers in order to sift through a plethora of potentially relevant theories and set appropriate regulations. Much of our research seeks to identify the effects of pricing and marketing on demand for short-term loan and savings products in developing countries.

Pinning down causal effects of financial institutions’ pricing and marketing strategies is complicated by at least five issues. One is the classic social science problem: Relying on observational data is fraught with the risk that changes in price or marketing are correlated with other changes — in firm strategy, in the macroeconomy, in household budget constraints — that drive selection. This is a particular concern when estimating treatment effects from expanding access to financial products such as credit, savings, or insurance. A second issue, intimately related to the first, is low statistical power due to limited variation in key policy parameters. A firm making a single change to pricing, a product, or marketing is basically generating a single data point of variation. The effects of the single change are difficult to disentangle from other contemporaneous changes affecting the firm and its constituents. This is a particular concern for savings products, as compared to loans, since one-size-fits-all pricing is more common and direct marketing is less common

with savings products. These two issues are the primary motivation for employing experimental methods.

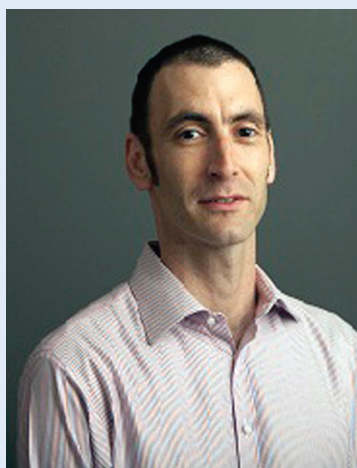
A third complicating issue is that most measures of demand sensitivity — for example, demand elasticities — are not fundamental or unchanging parameters. We expect demand sensitivities to change with factors like competition, labor market conditions, and search costs. A fourth issue is that a firm’s levers are rarely perfect representations of a single parameter. For example, variations in price, in particular, may be confounded by other factors changing simultaneously and may therefore lead to deceiving results if interpreted strictly as an estimate of demand sensitivity. A fifth issue is that strategy often requires an understanding of underlying mechanisms, while identifying mechanisms requires observing off-equilibrium behavior. For example, observing loan repayment and other borrower behaviors under atypical conditions can help test theories of asymmetric information or liquidity constraints.

We address these challenges using field experiments implemented by financial institutions in the course of their day-to-day operations. The partnering financial institutions randomly assign prices, communications, or access to products, generating variation that is uncorrelated with other factors that vary endogenously over time or people. This addresses Issue One above. The financial institutions randomize policies at the individual or neighborhood level in order to generate sufficient statistical power to identify causal effects. This addresses Issue Two. In some instances, the financial institutions’ randomized policies are implemented across sufficiently different people or markets, and are in place for long enough or with varying lengths of time, that we can examine under what conditions demand varies. This addresses Issue Three.¹ In another instance,



Dean Karlan is a professor of economics at Yale University and president of Innovations for Poverty Action, a nonprofit dedicated to discovering and promoting solutions to global poverty problems. He is on the Executive Committee of the Board of Directors and program chair for finance of the MIT Jameel Poverty Action Lab. At Innovations for Poverty Action, he is academic co-chair of the Global Financial Inclusion Initiative, the Small and Medium Enterprise Initiative, and the Ultra-Poor Safety Net Graduation Initiative.

As a social entrepreneur, Karlan is co-founder of stickK.com, a website that uses lessons from behavioral economics to help people reach personal goals. Karlan received a Presidential Early Career Award for Scientists and Engineers in 2007, and was named an Alfred P. Sloan Fellow the following year. In 2011 he co-authored *More Than Good Intentions: How a New Economics is Helping to Solve Global Poverty*. His education includes a Ph.D. in economics from MIT, an M.B.A. and an M.P.P. from the University of Chicago, and a B.A. in international affairs from the University of Virginia.



Jonathan Zinman is a professor of economics at Dartmouth College, and co-founder and scientific director of the U.S. Household Finance Initiative (USHFI) of Innovations for Poverty Action.

Zinman's research focuses on household finance and behavioral economics. He has published papers in several top journals in economics, finance, and general-interest science, and his work has been featured extensively in popular and trade media as well.

Zinman applies his research by working with policymakers and practitioners around the globe. He currently serves on the inaugural Consumer Advisory Board of the Consumer Financial Protection Bureau, as a visiting scholar at the Federal Reserve Bank of Philadelphia, and as a Community Development Research Advisory Council member for the Federal Reserve Bank of Boston. He also works directly with financial service providers, ranging from start-ups to nonprofits to publicly-traded companies, to develop and test innovations that are beneficial to both providers and their clients.

we use variation in price and advertising content to explore how those two levers interact, addressing Issue Four.² Lastly, through two-stage experimental designs, we have tackled typically unobserved behavior on loan repayment as well as returns to capital, which pertains to Issue Five.³

In our work,⁴ and in the work of others,⁵ we learn that financial markets for credit are not meeting the needs of the poor. In Mexico, the Philippines, and South Africa, we have found that financial institutions are able to expand access to microcredit by experimenting with risk-based pricing models or building offices in new geographic areas, effectively reducing the price of financial institution credit from infinity to a market rate for certain borrowers. Others have found the same to be true in Morocco, Bosnia and Herzegovina, Mongolia, India, and Ethiopia. Indeed, every study of which we are aware that has examined the impacts of expanding credit supply has found that the expansion increased borrowing and did not merely crowd out other lenders. Similarly, financial institutions offering new-commitment savings products for 6-to-24 month savings goals have found take-up rates typically around 20–30 percent.⁶ Other financial institutions have found similar unmet demand for commitment savings.⁷

A second finding from the studies above is that the marginal consumers of basic financial services derive a variety of financial benefits from them. This is an important reality check, given concerns that various biases in household decision-making can lead to counterproductive borrowing.⁸ Beyond the basic reality check, the several studies that follow random assignment to loan or savings product availability with extensive household and microenterprise surveys have yielded surprising findings. On the credit side, the results have yielded little support for microcredit's great promise of poverty alleviation and social transformation. Rather, the benefits have been modest, and concentrated more in household risk management and flexibility than in profitable microenterprise growth.⁹ On the savings side, the first wave of impact evaluations has

produced evidence of some important impacts, tested typically with some aspect of commitment to the product,¹⁰ with several studies pursuing further work to unpack mechanisms underlying the impacts.¹¹

A third finding from our work is that information asymmetries complicate lenders' pricing strategies. Our work in the South Africa "cash loan" market and an individual-liability microloan market in the Philippines finds evidence of substantial moral hazard.¹² These papers also suggest that this problem

additional information that lenders could use to screen or price ex-ante and thereby mitigate adverse selection.

A fourth finding is that household demand for commitment savings balances is not sensitive to price, at least within the range of market rates found in the Philippines.¹⁴ This is somewhat puzzling in light of our next set of findings—substantial price sensitivity to consumer credit interest rates—although we emphasize that whether this finding applies to other types

sensitivity; more recently, we worked with a large microlender in Mexico to randomize interest rates at the level of 80 geographical regions across the country, with experimental rates in place for 30 months.¹⁶ This design allows us to estimate elasticities over different time horizons that internalize any spillovers (e.g., information transmission) within regions. We find that loan demand is more or less unit elastic (-1) in year one, with price sensitivity increasing over time to around -3 in year three. This degree of price sensitivity is much larger than anything else found in the literature to date, with the exception of our finding on price increases in South Africa.¹⁷ We attribute this to our design's ability to capture a long-run equilibrium, as opposed, for example, to a temporary and isolated promotion.

But our most surprising finding on price sensitivity comes from a new paper on a large Turkish bank's experiment with direct-marketing of an overdraft line of credit.¹⁸ Messages mentioning the cost of overdrafting reduce overdraft usage, even though those messages offer a 50 percent rebate on overdraft interest: Substantially reducing the price of the commodity reduces demand for it. This finding is consistent with models of shrouded equilibria in which firms lack incentives to draw attention to add-on prices;¹⁹

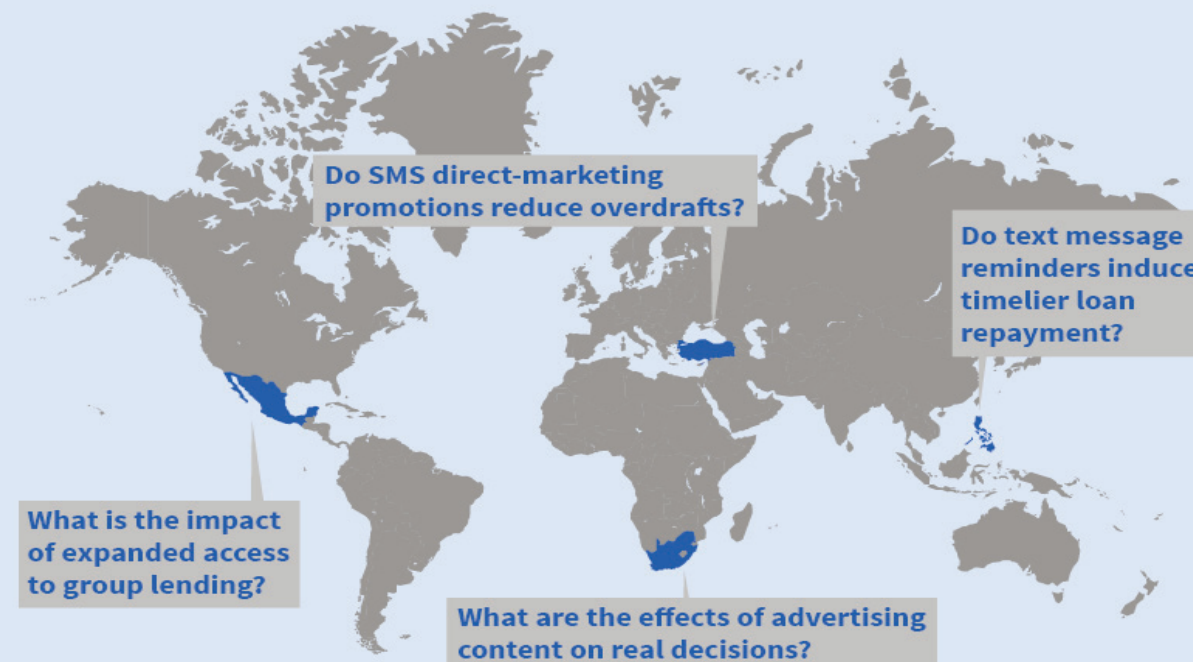
this and other findings in the paper, discussed below, are consistent with a model of limited attention and memory.²⁰

A sixth finding is that communications of various types can greatly affect demand. Our direct-marketing experiment in South Africa randomized mailer content alongside price and found the advertising content had large effects.²¹ We find some evidence that content designed to trigger automatic responses was more effective than content designed to trigger deliberative responses, but overall it was difficult to predict exactly which types of ad content would affect

demand based on prior work on behavioral economics. Our experiment in Turkey varied messaging content and intensity as well as overdraft pricing, and we found evidence that both of these levers mattered greatly. In contrast to the core finding on price—that mentioning it reduces demand for overdrafts—simply mentioning overdraft availability substantially increases demand. And more intense messaging—sending the same message more often—amplifies both the demand-increasing effects of advertising overdraft availability and the demand-decreasing effects of advertising an overdraft price reduction. On the savings side, we have found, across three different banks in three different countries, that sending reminders to new commitment savings account customers increases commitment attainment.²² Messages that mention both savings goals and financial incentives are particularly effective, while other content variations such as gain versus loss framing do not have significantly different effects. This set of studies speaks to the importance of limited and malleable consumer attention to household finances.²³

The findings reviewed here, taken together with the work of many other researchers, are initial steps toward unpacking the nature and implications of household demand for financial services. Our recent review articles highlight many opportunities for future work.²⁴

QUESTIONS ABOUT FINANCIAL SERVICES AROUND THE GLOBE



Sources: NBER Working Papers 17592, 19119, 20956 and *Quarterly Journal of Economics* (2010)

can be addressed with stronger dynamic incentives and repayment reminders from loan officers. Another paper develops an experimental design to test for an interaction between ex-ante and ex-post asymmetric information problems—in our setting, selection on malleability to repayment incentives—and does not rule out an empirically important interaction, although the estimates are imprecise.¹³ That paper also tests a remedy—incentivized peer referrals—and finds evidence that referring peers are very helpful in pressuring friends to repay ex-post (thereby mitigating moral hazard). It does not find evidence that peers have

of savings instruments and settings is an open question.

A fifth finding from our work is that household demand for consumer credit is price sensitive, and sometimes in surprising ways. Our early work in this area consisted of direct-mail experiments with a small-dollar lender in South Africa.¹⁵ Potential borrowers were price sensitive, but not elastic, with respect to price cuts [$0 > \text{elasticity} > -1$] and were extremely elastic with respect to price increases. Direct-mail promotional experiments have the drawback of identifying short-run rather than steady-state price

¹ D. Karlan and J. Zinman, "Long-Run Price Elasticities of Demand for Credit: Evidence from a Countrywide Field Experiment in Mexico," NBER Working Paper No. 19106, June 2013; and M. Angelucci, D. Karlan, and J. Zinman, "Win Some Lose Some? Evidence from a Randomized Microcredit Program Placement Experiment by Compartamos Banco," NBER Working Paper No. 19119, June 2013.

[Return to text.](#)

² S. Alan, M. Cemalcilar, D. Karlan, J. Zinman, "Unshrouding Effects on Demand for a Costly Add-on: Evidence from Bank Overdrafts in Turkey," NBER Working Paper No. 20956, February 2015.

[Return to text.](#)

³ See D. Karlan and J. Zinman, “Observing Unobservables: Identifying Information Asymmetries with a Consumer Credit Field Experiment,” *Econometrica*, 77(6), 2009, pp.1993–2008; G. Bryan, D. Karlan, and J. Zinman, “Referrals: Peer Screening and Enforcement in a Consumer Credit Field Experiment,” NBER Working Paper No. 17883, March 2012, and American Economic Journal: Microeconomics, forthcoming; and L. Beaman, D. Karlan, B. Thuysbaert, C. Udry, “Self-Selection into Credit Markets: Evidence from Agriculture in Mali,” NBER Working Paper No. 20387, August 2014. [Return to text.](#)

⁴ See D. Karlan and J. Zinman, “Expanding Credit Access: Using Randomized Supply Decisions to Estimate the Impacts,” *Review of Financial Studies*, 23(1), 2010, pp.433–64; D. Karlan and J. Zinman, “Microcredit in Theory and Practice: Using Randomized Credit Scoring for Impact Evaluation,” *Science*, 332(6035), 2011, pp.1278–84; M. Angelucci, D. Karlan, and J. Zinman, “Microcredit Impacts: Evidence from a Randomized Microcredit Program Placement Experiment by Compartamos Banco,” NBER Working Paper No. 19827, January 2014, and American Economic Journal: Applied Economics, 7(1), 2015, pp.151–82; and A. Banerjee, D. Karlan, and J. Zinman, “Six Randomized Evaluations of Microcredit: Introduction and Further Steps,” *American Economic Journal: Applied Economics*, 7(1), 2015, pp.1–21. [Return to text.](#)

⁵ See O. Attanasio, B. Augsburg, R. De Haas, E. Fitzsimons, and H. Harmgart, “The Impacts of Microfinance: Evidence from Joint-Liability Lending in Mongolia,” *American Economic Journal: Applied Economics*, 7(1), 2015, pp.90–122; B. Augsburg, R. De Haas, H. Harmgart, and C. Meghir, “The Impacts of Microcredit: Evidence from Bosnia and Herzegovina,” NBER Working Paper No. 18538, November 2012, and American Economic Journal: Applied Economics, 7(1), 2015, pp.183–203; A. Tarozzi, J. Desai, and K. Johnson, “The Impacts of

Microcredit: Evidence from Ethiopia,” *American Economic Journal: Applied Economics*, 7(1), 2015, pp.54–89; E. Duflo, A. Banerjee, R. Glennerster, C. G. Kinnan, “The Miracle of Microfinance? Evidence from a Randomized Evaluation,” NBER Working Paper No. 18950, May 2013, and American Economic Journal: Applied Economics, 7(1), 2015, pp.22–53; and B. Crépon, F. Devoto, E. Duflo, W. Pariente, “Estimating the Impact of Microcredit on Those Who Take It Up: Evidence from a Randomized Experiment in Morocco,” NBER Working Paper No. 20144, May 2014, and American Economic Journal: Applied Economics, 7(1), 2015, pp.123–50. [Return to text.](#)

⁶ See D. Karlan and J. Zinman, “Price and Control Elasticities of Demand for Savings,” *Yale Working Paper*, 2014. http://karlan.yale.edu/p/SavingsElasticities_2014_01_v9.pdf; D. Karlan, M. McConnell, S. Mullainathan, and J. Zinman, “Getting to the Top of Mind: How Reminders Increase Saving,” NBER Working Paper No. 16205, July 2010, and *Management Science*, forthcoming; and N. Ashraf, D. Karlan, and W. Yin, “Tying Odysseus to the Mast: Evidence from a Commitment Savings Product in the Philippines,” *Quarterly Journal of Economics*, 121(2), 2006, pp.635–72. [Return to text.](#)

⁷ See P. Dupas and J. Robinson, “Savings Constraints and Microenterprise Development: Evidence from a Field Experiment in Kenya,” NBER Working Paper No. 14693, January 2009, and *American Economic Journal: Applied Economics*, 5(1), 2013, pp.163–92; P. Dupas and J. Robinson, “Why Don’t the Poor Save More? Evidence from Health Savings Experiments,” NBER Working Paper No. 17255, July 2011, and *American Economic Review*, 103(4), 2013, pp.1138–71; and S. Prina, “Banking the Poor via Savings Accounts: Evidence from a Field Experiment,” *Journal of Development Economics*, forthcoming. [Return to text.](#)

⁸ For reviews of decision-making biases

and other potential sources of inefficiency in markets for household debt and savings products, see D. Karlan, A. Ratan, and J. Zinman, “Savings by and for the Poor: A Research Review and Agenda,” *Review of Income and Wealth*, 60(1), 2014, pp.36–78; and J. Zinman, “Consumer Credit: Too Much or Too Little (or Just Right)?” NBER Working Paper No. 19682, November 2013, and *Journal of Legal Studies*, 43(S2) (Special Issue on Benefit-Cost Analysis of Financial Regulation), 2014, pp.S209–37. [Return to text.](#)

⁹ See endnotes 4 and 5 for the relevant citations. [Return to text.](#)

¹⁰ See D. Karlan, A. Ratan, and J. Zinman, “Savings by and for the Poor: A Research Review and Agenda,” *Review of Income and Wealth*, 60(1), 2014, pp.36–78; and J. Jamison, D. Karlan, and J. Zinman, “Financial Education and Access to Savings Accounts: Complements or Substitutes? Evidence from Ugandan Youth Clubs,” NBER Working Paper No. 20135, May 2014. [Return to text.](#)

¹¹ See L. Beaman, D. Karlan, and B. Thuysbaert, “Saving for a (not So) Rainy Day: A Randomized Evaluation of Savings Groups in Mali,” NBER Working Paper No. 20600, October 2014; and M. Callen, S. De Mel, C. McIntosh, C. Woodruff, “What Are the Headwaters of Formal Savings? Experimental Evidence from Sri Lanka,” NBER Working Paper No. 20736, December 2014. [Return to text.](#)

¹² See D. Karlan and J. Zinman. “Observing Unobservables: Identifying Information Asymmetries with a Consumer Credit Field Experiment,” *Econometrica*, 77(6), 2009, pp.1993–2008; and D. Karlan, M. Morten, and J. Zinman, “A Personal Touch: Text Messaging for Loan Repayment,” NBER Working Paper No. 17952, March 2012. [Return to text.](#)

¹³ G. Bryan, D. Karlan, and J. Zinman, “Referrals: Peer Screening and Enforcement in a Consumer Credit Field

Experiment,” NBER Working Paper No. 17883, March 2012, and *American Economic Journal: Microeconomics*, forthcoming. [Return to text.](#)

¹⁴ D. Karlan and J. Zinman, “Price and Control Elasticities of Demand for Savings,” *Yale Working Paper*, 2014. http://karlan.yale.edu/p/SavingsElasticities_2014_01_v9.pdf. [Return to text.](#)

¹⁵ D. Karlan and J. Zinman, “Credit Elasticities in Less-Developed Economies: Implications for Microfinance,” *The American Economic Review*, 98(3), 2008, 1040–68. [Return to text.](#)

¹⁶ D. Karlan and J. Zinman, “Long-Run Price Elasticities of Demand for Credit: Evidence from a Countrywide Field Experiment in Mexico,” NBER Working Paper No. 19106, June 2013. [Return to text.](#)

¹⁷ For a review of literatures on loan pricing and price sensitivity, as well as several of the other literatures referenced here, see J. Zinman, “Household Debt: Facts, Puzzles, Theories, and Policies,” NBER Working Paper 20496, September 2014, and *Annual Review of Economics*, 7, forthcoming. [Return to text.](#)

¹⁸ S. Alan, M. Cemalcılar, D. Karlan,

and J. Zinman, “Unshrouding Effects on Demand for a Costly Add-on: Evidence from Bank Overdrafts in Turkey,” NBER Working Paper No. 20956, February 2015. [Return to text.](#)

¹⁹ See, e.g., X. Gabaix and D. Laibson, “Shrouded Attributes, Consumer Myopia, and Information Suppression in Competitive Markets,” NBER Working Paper No. 11755, November 2005 and *Quarterly Journal of Economics* 121(2), 2006, 505–40. [Return to text.](#)

²⁰ P. Bordalo, N. Gennaioli, and A. Shleifer, “Memory, Attention, and Choice,” *Royal Holloway University of London February 2015 Working Paper*, http://scholar.harvard.edu/files/shleifer/files/evokedsets_march2_0.pdf. [Return to text.](#)

²¹ M. Bertrand, D. Karlan, S. Mullainathan, E. Shafir and J. Zinman, “What’s Advertising Content Worth? Evidence from a Consumer Credit Marketing Field Experiment,” *Quarterly Journal of Economics*, 12(1), 2010, pp.263–305. [Return to text.](#)

²² D. Karlan, M. McConnell, S. Mullainathan, and J. Zinman, “Getting to the Top of Mind: How Reminders Increase Saving,” NBER Working

Paper No. 16205, July 2010, and *Management Science*, forthcoming. [Return to text.](#)

²³ See also our work on priming (non-) effects on demand for (microcredit) microinsurance: A. Zwane, J. Zinman, E. Van Dusen, W. Pariente, C. Null, E. Miguel, M. Kremer, D. S. Karlan, R. Hornbeck, X. Giné, E. Duflo, F. Devoto, B. Crépon, and A. Banerjee, “Being Surveyed Can Change Later Behavior and Related Parameter Estimates,” *Proceedings of the National Academy of Sciences*, 108(5), 2011, pp.1821–26; and V. Stango and J. Zinman, “Limited and Varying Consumer Attention: Evidence from Shocks to the Salience of Bank Overdraft Fees,” NBER Working Paper No. 17028, May 2011, and *Review of Financial Studies*, 27(4), 2014, pp.990–1030. [Return to text.](#)

²⁴ See D. Karlan, A. Ratan, and J. Zinman, “Savings by and for the Poor: A Research Review and Agenda,” *Review of Income and Wealth*, 60(1), 2014, pp.36–78; and J. Zinman, “Household Debt: Facts, Puzzles, Theories, and Policies,” NBER Working Paper 20496, September 2014, and *Annual Review of Economics*, 7, forthcoming. [Return to text.](#)



Assessing the Effects of Monetary and Fiscal Policy

Emi Nakamura and Jón Steinsson

Monetary and fiscal policies are central tools of macroeconomic management. This has been particularly evident since the onset of the Great Recession in 2008. In response to the global financial crisis, U.S. short-term interest rates were lowered to zero, a large fiscal stimulus package was implemented, and the Federal Reserve engaged in a broad array of unconventional policies.

Despite their centrality, the question of how effective these policies are and therefore how the government should employ them is in dispute. Many economists have been highly critical of the government's aggressive use of monetary and fiscal policy during this period, in some cases arguing that the policies employed were ineffective and in other cases warning of serious negative consequences. On the other hand, others have argued that the aggressive employment of these policies has "walk[ed] the American economy back from the edge of a second Great Depression."¹

In our view, the reason for this controversy is the absence of conclusive empirical evidence about the effectiveness of these policies. Scientific questions about how the world works are settled by conclusive empirical evidence. In the case of monetary and fiscal policy, unfortunately, it is very difficult to establish such evidence. The difficulty is a familiar one in economics, namely endogeneity.

Consider monetary policy. The whole reason for the existence of the Federal Reserve as an institution is to conduct systematic monetary policy that responds to developments in the economy. Every Fed decision is pored over by hundreds of Ph.D. economists. This leaves little room for the type of exogenous variation in policy that is so useful in identifying the effects of policy moves on the economy. For example, the Fed lowered interest rates in the second half of 2008 in response to the developing financial crisis. Running a regression of changes in output on changes in policy in this case

clearly will not identify the effect of the monetary policy actions on output since the financial crisis — the event that induced the Fed to change policy — is a confounding factor. The same problems apply when it comes to fiscal policy.

This difficulty has led macroeconomists to use a wide array of empirical methods — some based on structural models, others based more heavily on natural experiments — to shed light on the effects of monetary and fiscal policy. Over the past 10 years, there have been exciting empirical developments on both fronts.

In terms of structural methods, a core idea in macroeconomics is that the degree of price rigidity in the economy is a key determinant of the extent to which monetary and fiscal policy (and other demand shocks) affect the economy. If prices are very flexible, a change in demand from some source — say, the government — will induce prices to rise, and this will crowd out demand from other sources. However, if prices are slow to react, this crowd-out does not occur and *aggregate* demand increases.

An important innovation in recent years has been the use of large micro datasets that underlie the U.S. consumer, producer, import, and export price indexes to measure the degree of price rigidity in the economy.² We were among the first researchers to use these data to characterize price rigidity.³ One of our main conclusions was that distinguishing between different types of price changes is crucial in mapping workhorse macro models into the data.⁴ In particular, a very substantial fraction of price changes are due to temporary sales after which the price returns to its original level. In most workhorse macro models, the frequency of price adjustment directly determines the responsiveness of the aggregate price level to shocks. The prevalence of temporary sales raises the question of whether the raw frequency of price changes is a

good measure of the responsiveness of inflation to demand shocks. Subsequent work has argued quite convincingly that, because of their transitory nature, temporary sales result in very little adjustment of the aggregate price level.⁵ In our own work on this topic, we present evidence that temporary sales are unresponsive to cost shocks and discuss institutional features of price setting by packaged-goods manufacturers that suggest that temporary sales follow sticky plans that are determined with long lead times.⁶

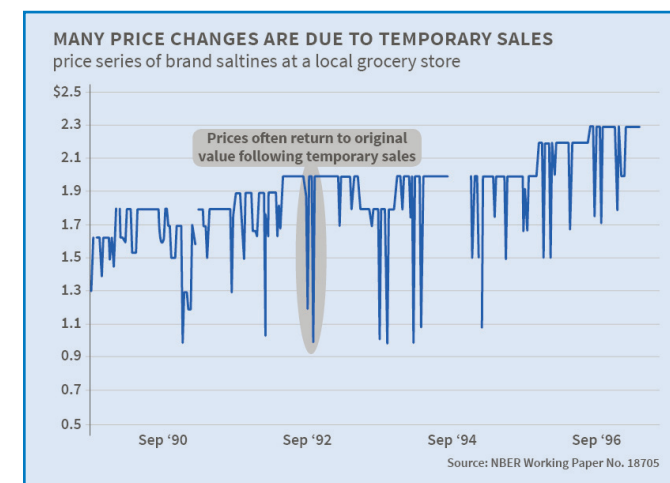
A second important conclusion that emerges from the recent empirical literature on price rigidity is that, while prices change often if one looks at an average across the

Incorporating heterogeneity in price flexibility and intermediate inputs into a menu cost model allows us to generate a substantial role for nominal shocks in business cycle fluctuations, in line with evidence from aggregate data.

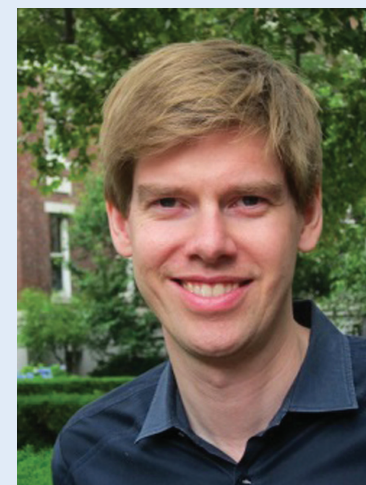
Progress in structural modeling has dovetailed with important innovations in assessing the effects of monetary policy using natural experiments and other non-structural methods. Again, the key challenge in estimating the effects of monetary policy is the endogeneity of monetary policy actions. In recent work, we use a discontinuity-based identification strategy to address the endogeneity problem.⁸

Our identification approach is to study how real interest rates respond to monetary shocks in the 30-minute intervals around Federal Open Market Committee announcements. We find that in these short intervals, nominal and real interest rates for maturities as long as several years move roughly one-for-one with each other. Changes in nominal interest rates at the time of monetary announcements therefore translate almost entirely into changes in real interest rates, while expected inflation moves very little except at very long horizons.

We use this evidence to estimate the parameters of a conventional monetary business cycle model. A popular approach to estimating such models in the literature has been to match the impulse responses from structural vector autoregressions (VARs). We use a similar approach, but instead of using impulse responses from a structural VAR, we use the responses from our high-frequency-based identification strategy. This approach suggests that monetary non-neutrality is large. Intuitively, our evidence indicates that a monetary shock that yields a substantial response for real interest rates also yields a very small response for inflation. This suggests that prices respond quite sluggishly to changes in aggregate economic conditions and that monetary policy can



whole economy, price adjustment is highly concentrated in certain sectors. Some products (like gasoline) have prices that adjust repeatedly within the span of a quarter, while other products (like services) often do not adjust for a year or longer. We show that this uneven distribution of price changes yields substantially less aggregate price flexibility than if price flexibility were more evenly distributed.⁷ A more-even distribution of price changes across sectors would be associated with a greater frequency of changes in prices that had not yet adjusted to past aggregate shocks. We also show it is important to recognize the degree of flexibility in intermediate good prices when analyzing monetary non-neutrality. If a firm's input prices do not adjust, it will have less incentive to adjust the prices of its output than when its input costs are rising.



Jón Steinsson is a Research Associate in the NBER's Monetary Economics and Economic Fluctuations and Growth Programs. He is an associate professor of economics at Columbia University. He received a bachelor's degree in economics from Princeton University in 2000 and a Ph.D. from Harvard University in 2007. He is a member of the board of editors of the *American Economic Review*.

His main area of research is empirical macroeconomics. His work has focused on characterizing price rigidity and its macroeconomic consequences, identifying the effects of monetary and fiscal policies, measuring disaster risk and long-run risks, exchange-rate pass-through, and understanding the effects of forward guidance on the economy.

He grew up in Iceland and currently lives in New York City with his wife and son. In his spare time, he writes op-eds about economics and politics in Icelandic newspapers and cycles up the Hudson River valley.

have large effects on the economy.

Another area in which there has been rapid progress in using innovative identification schemes to esti-

mate the impact of macroeconomic policy is that of fiscal stimulus.⁹ Just as with monetary policy, there is an important identification problem: Fiscal stimulus is generally undertaken in response to recessions, so one cannot assume that correlations reflect a causal effect. Much of the literature on fiscal stimulus that makes use of natural experiments focuses on the effects of war-time spending, since it is assumed that in some cases such spending is unrelated to the state of the economy. Fortunately—though unfortunately for empirical researchers—there are only so many large wars, so the number of data points available from this approach is limited.

In our work, we use cross-state variation in military spending to shed light on the fiscal multiplier.¹⁰ The basic idea is that when the U.S. experiences a military build-up, military spending will increase in states such as California—a major producer of military goods—relative to states, such as Illinois, where there is little military production. This approach uses a lot more data than the earlier literature on military spending but makes weaker assumptions, since we require only that the U.S. did not undertake a military build-up in response to the *relative* weakness of the economy in California vs. Illinois. We show that a \$1 increase in military spending in California relative to Illinois yields a relative increase in output of \$1.50. In other words, the “relative” multiplier is quite substantial.¹¹

There is an important issue of interpretation here. We find evidence of a large “relative multiplier,” but does this imply that the aggregate multiplier also will be large? The challenge that arises in interpreting these kinds of relative estimates is that there are general equilibrium effects that are expected to operate at an aggregate but not at a local level. In particular, if government spending is increased at the aggregate level, this will induce the Federal Reserve to tighten monetary policy, which will then counteract some of the stimulative effect of the increased government spending. This type of general equilibrium effect does not arise at the local level, since the Fed can’t raise

interest rates in California vs. Illinois in response to increased military spending in California relative to Illinois.

We show in our paper, however, that the relative multiplier does have a very interesting counterpart at the level of the aggregate economy. Even in the aggregate setting, the general equilibrium response of monetary policy to fiscal policy will be constrained when the risk-free nominal interest rate is constrained by its lower bound of zero. Our relative multiplier corresponds more closely to the aggregate multiplier in this case.¹² Our estimates are, therefore, very useful in distinguishing between new Keynesian models, which generate large multipliers in these scenarios, and plain vanilla real business cycle models, which always generate small multipliers.

The evidence from our research on both fiscal and monetary policy suggests that demand shocks can have large effects on output. Models with price-adjustment frictions can explain such output effects, as well as (by design) the microeconomic evidence on price rigidity. Perhaps this evidence is still not conclusive, but it helps to narrow the field of plausible models. This new evidence will, we hope, help limit the scope of policy predictions of macroeconomic models that policymakers need to consider the next time they face a great challenge.

¹ C. Romer, “Back from the Brink,” *Speech delivered at the Federal Reserve Bank of Chicago, September 24, 2009.* http://eml.berkeley.edu/~cromer/Back_from_the_Brink2.pdf.

[Return to text.](#)

² We survey the resulting literature in E. Nakamura and J. Steinsson, “Price Rigidity: Microeconomic Evidence and Macroeconomic Implications,” NBER Working Paper No. 18705, January 2013, and Annual Review of Economics, 5, 2013, pp. 133–63.

[Return to text.](#)

³ See also M. Bils and P. Klenow, “Some Evidence on the Importance of Sticky Prices,” NBER Working Paper No. 9069, July 2002, and Journal of

Political Economy, 112(5), 2004, pp. 947–85; P. Klenow and O. Kryvtsov, “State-Dependent or Time-Dependent Pricing: Does it Matter for Recent U.S. Inflation?” NBER Working Paper No. 11043, January 2005, and Quarterly Journal of Economics, 123(3), 2008, pp. 863–904; G. Gopinath and R. Rigobon, “Sticky Borders,” NBER Working Paper No. 12095, March 2006, and Quarterly Journal of Economics 123(2), 2008, pp. 531–75.

[Return to text.](#)

⁴ E. Nakamura and J. Steinsson, “Five Facts about Prices: A Reevaluation of Menu Cost Models,” Quarterly Journal of Economics, 123(4), 2008, pp. 1215–1464.

[Return to text.](#)

⁵ See P. Kehoe and V. Midrigan, “Prices Are Sticky After All,” NBER Working Paper No. 16364, September 2010; B. Guimaraes and K. Sheedy, “Sales and Monetary Policy,” American Economic Review, 101(2), 2011, pp. 844–76.

[Return to text.](#)

⁶ E. Anderson, E. Nakamura, D. Simester, and J. Steinsson, “Information Rigidities and the Stickiness of Temporary Sales,” NBER Working Paper No. 19350, August 2013.

[Return to text.](#)

⁷ E. Nakamura and J. Steinsson, “Monetary Non-Neutrality in a Multi-Sector Menu Cost Model,” NBER Working Paper No. 14001, May 2008, and Quarterly Journal of Economics, 125(3), 2010, pp. 961–1013. See also, C. Carvalho, “Heterogeneity in Price Stickiness and the New Keynesian Phillips Curve,” B.E. Journals in Macroeconomics: Frontiers of Macroeconomics, 6(3), 2006, 1–58.

[Return to text.](#)

⁸ E. Nakamura and J. Steinsson, “High Frequency Estimation of Monetary Non-Neutrality,” NBER Working Paper No. 19260, July 2013. Our work builds on important early papers using this identification strategy, including T. Cook and T. Hahn, “The Effect of Changes in the Federal Funds Rate Target on Market Interest Rates in the 1970s,” Journal of Monetary Economics, 24(3), 1989, pp.

331–51; K. Kuttner, “Monetary Policy Surprises and Interest Rates: Evidence from the Fed Funds Rate Market,” Journal of Monetary Economics, 47(3), 2001, pp. 523–44; R. Gurkaynak, B. Sack, and E. Swanson, “Do Actions Speak Louder than Words? The Response of Asset Prices to Monetary Policy Actions and Statements,” International Journal of Central Banking, 1(1), 2005, pp. 55–93. See also the recent literature studying the effect of monetary shocks, including: S. Hanson and J. Stein, “Monetary Policy and Long-Term Real Rates,” Harvard University Working Paper, 2014. http://www.people.hbs.edu/shanson/long_rate_paper_20141009_JFE_FINAL.pdf; M. Gertler and P. Karadi, “Monetary Policy Surprises, Credit Costs and Economic Activity,” New York University Working Paper, 2013. <http://www.econ.nyu.edu/user/gertlerm/GertlerKaradi2013Oct3draftd-3.pdf>.

[Return to text.](#)

⁹ Interesting work along these lines

includes D. Shoag, “The Impact of Government Spending Shocks Evidence on the Multiplier from State Pension Plan Returns,” Harvard University Working Paper, 2011. http://www.hks.harvard.edu/fs/dshoag/Documents/shoag_jmp.pdf; A. Acconcia, G. Corsetti, and S. Simonelli, “Mafia and Public Spending Evidence on the Fiscal Multiplier from a Quasi-Experiment,” American Economic Review, 104(7), 2014, pp. 2185–2209; G. Chodorow-Reich, L. Feiveson, Z. Liscow, and W. G. Woolston, “Does State Fiscal Relief During Recessions Increase Employment? Evidence from the American Recovery and Reinvestment Act,” American Economic Journal: Economic Policy, 4(3), 2012, pp. 118–45; J. Serrato, and P. Wingender, “Estimating Local Fiscal Multipliers,” Duke University Working Paper, 2014. http://www.jcsuarez.com/Files/Suarez_Serrato-Wingender-ELFM_Resubmitted.pdf.

[Return to text.](#)

¹⁰ E. Nakamura and J. Steinsson, “Fiscal Stimulus in a Monetary Union: Evidence from U.S. Regions,” NBER Working Paper No. 17391, September 2011, and American Economic Review, 104(3), 2014, pp. 753–92.

[Return to text.](#)

¹¹ More specifically, we refer to this as the “open economy relative multiplier.”

[Return to text.](#)

¹² See G. Eggertsson, “What Fiscal Policy Is Effective at Zero Interest Rates?” in D. Acemoglu and M. Woodford, eds., NBER Macroeconomics Annual, 25, Chicago, Illinois, University of Chicago Press, 2010, pp. 59–112; and L. Christiano, M. Eichenbaum, and S. Rebelo, “When Is the Government Spending Multiplier Large?” NBER Working Paper No. 15394, October 2009, and Journal of Political Economy, 119(1), 2011, pp. 78–121.

[Return to text.](#)

2014 Awards and Honors

A number of NBER researchers received honors, awards, and other forms of professional recognition during 2014. A list of the honors reported by these researchers, excluding those that were bestowed by the researcher’s home university, is presented below.

Orley Ashenfelter was awarded an Honorary Doctorate in Economics by the Charles University in Prague.

Martha Bailey’s article with Nicolas J. Duquette, “How the U.S. Fought the War on Poverty: The Economics and Politics of Funding at the Office of Economic Opportunity,” *Journal of Economic History*, June 2014, pp. 351–88 (NBER Working Paper No. [19860](#)), won the Arthur H. Cole Prize for year’s best article published in the *Journal of Economic History*.

David Autor was elected a Fellow of the Econometric Society.

Alan Blinder’s book, “After the Music Stopped: The Financial Crisis, the Response, and the Work Ahead,” London, United Kingdom: Penguin, 2013, was named by The New York Times as one of the five Best Nonfiction Books of 2013.

Jeffrey Brown was awarded the Achievement in Applied Retirement Research Award from the Retirement Income Industry Association.

Erik Brynjolfsson and his co-authors Frank MacCrory, George Westerman, and Yousef Alhammadi won the 2014 International Conference on Information Systems Award for Best Conference Paper for “Racing With and Against the Machine: Changes in Occupational Skill Composition in an Era of Rapid Technological Advance.”

John Campbell received the Eugene Fama Prize for Outstanding

Contributions to Doctoral Education from the University of Chicago Booth School of Business for his 1997 book, “The Econometrics of Financial Markets”, which was co-authored with Andrew Lo and Craig MacKinlay.

Dennis Carlton was named the 2014 Distinguished Fellow of the Industrial Organization Society in recognition of excellence in research, education and leadership in the field of industrial organization.

John Cawley received an Investigator Award in Health Policy Research from the Robert Wood Johnson Foundation.

Janet Currie was elected a Fellow of the American Academy of Arts and Sciences and began service as President of the Society of Labor Economists. She was also the 2014 Eleanor Roosevelt Fellow of the American Academy of Political and Social Science.

Angus Deaton was elected to membership in the American Philosophical Society.

Amy Finkelstein received the 2014 American Society of Health Economists Medal, a biennial award recognizing the economist age 40 or under who has made the most significant contributions to the field of health economics. She and co-authors Erzo F. P. Luttmer and Matthew J. Notowidigdo also received the 2014 Hicks-Tinbergen Award from the European Economic Association, an award that recognizes an outstand-

ing article published during a two-year period in the Association’s journal. This award was for their “What Good Is Wealth Without Health? The Effect of Health on the Marginal Utility of Consumption,” *Journal of the European Economic Association*, January 2013, pp. 221–58 (NBER Working Paper No. [14089](#)).

Kristin Forbes was named an external Member of the Monetary Policy Committee for the Bank of England, serving a three year term from 2014 to 2017.

Don Fullerton was named the Nannerl O. Keohane Distinguished Visiting Professor at the University of North Carolina at Chapel Hill and Duke University, a position that is designed “to promote inter-institutional collaboration and the enhancement of intellectual life at both universities.”

Martin Gaynor was elected to the National Academy of Social Insurance.

Matthew Gentzkow received the John Bates Clark Medal from the American Economic Association, an award that honors “that American economist under the age of forty who is judged to have made the most significant contribution to economic thought and knowledge.”

Robert J. Gordon was named a Distinguished Fellow of the American Economic Association. His award marks the first time this honor has been awarded to both to a father and a son. Gordon’s father, Robert

Aaron Gordon, was named an AEA Distinguished Fellow in 1972.

Michael Greenstone was elected a Fellow of the American Academy of Arts and Sciences.

James Hamilton received the Outstanding Contributions to the Profession Award for 2014 from the International Association for Energy Economics.

James Heckman and his co-authors Flávio Cunha and Susanne M. Schennach were awarded the Frisch Medal for their paper, “Estimating the Technology of Cognitive and Noncognitive Skill Formation.” (NBER Working Paper No. [15664](#).) The Econometric Society awards the Frisch Medal every two years for an applied article published in *Econometrica* during the past five years. Heckman also received the Spirit of the Erikson Institute Award from the Erikson Institute for his work on the economics of early childhood development.

Garth Heutel received the 2014 Outstanding Paper Award from *Public Finance Review*, March 2014, pp.143–75 (NBER Working Paper No. [15004](#)), for his paper “Crowding Out and Crowding In of Private Donations and Government Grants.”

Hilary Hoynes received the Carolyn Shaw Bell Award from the American Economic Association’s Committee on the Status of Women in the Economics Profession, an award that honors an individual who has furthered the status of women in the economics profession through example, achievements, or mentoring others.

Robert Johnson and his co-author Guillermo Noguera received the 2014 Bhagwati Award for the best article in the *Journal of International Economics* over the previous two years for their paper on “Accounting for Intermediates:

Production Sharing and Trade in Value Added,” 86(2), pp. 224–36.

Loukas Karabarbounis received the Excellence Award in Global Economic Affairs from the Kiel Institute for the World Economy.

Lawrence Katz was elected to the National Academy of Sciences, and completed his term as President of the Society of Labor Economists.

B. Zorina Khan was appointed a 2014–15 W. Glenn Campbell and Rita Ricardo-Campbell National Fellow and the Arch W. Shaw National Fellow at the Hoover Institution. She also received the Leonardo da Vinci Fellowship award for research on intellectual property.

Brian Kovak received the 2014 IZA Young Labor Economist Award, which recognizes “an outstanding published paper in labor economics written by young researchers,” for his paper “Regional Effects of Trade Reform: What is the Correct Measure of Liberalization?” *American Economic Review*, August 2013, pp.1960–76.

Amanda Kowalski received a National Science Foundation CAREER Award.

Camelia Kuhnen served as President of the Society for Neuroeconomics.

Jonathan Levin was awarded a John Simon Guggenheim Memorial Fellowship and was elected to the American Academy of Arts and Sciences.

Annamaria Lusardi received the 2014 William A. Forbes Public Awareness Award from the Council for Economic Education.

Erzo F. P. Luttmer and his co-authors Amy Finkelstein and Matthew Notowidigdo received the 2014 Hicks-

Tinbergen medal from the European Economic Association.

Robert Margo was elected President of the Economic History Association.

Enrico Moretti was elected a Fellow of the Society of Labor Economists and received the Society’s Sherwin Rosen Prize, awarded for Outstanding Contributions in the Field of Labor Economics.

Emi Nakamura received the Elaine Bennett Research Prize from the American Economic Association’s Committee on the Status of Women in the Economics Profession, an award that recognizes and honors outstanding research in any field of economics by a woman not more than seven years beyond her Ph.D.

Joseph Paul Newhouse received the Victor R. Fuchs Lifetime Achievement Award from the American Society of Health Economists.

Matthew Notowidigdo and his co-authors Amy Finkelstein and Erzo F. P. Luttmer received the 2014 Hicks-Tinbergen medal from the European Economic Association.

Lubos Pastor and his co-authors Robert Stambaugh and Lucian Taylor received two best paper prizes, one from the Jacobs Levy Equity Management Center for Quantitative Financial Research and one from the Rothschild Caesarea Center 11th Annual Academic Conference, for their paper “Scale and Skill in Active Management.”

Thomas Philippon received the Germán Bernácer Prize from the Observatorio del Banco Central Europeo, an award that honors outstanding economic research by a European economist under the age of 40.

Robert Porter served as President of the Econometric Society.



James Poterba delivered the Richard T. Ely Lecture at the 2014 meetings of the American Economic Association, served as President of the European Economic Association, and received the Daniel M. Holland Award from the National Tax Association.

Dani Rodrik received an honorary doctorate from the University of Groningen.

Jóse Scheinkman was awarded

the 2014 Prize in Innovative Quantitative Applications by the CME-Group and the Mathematical Sciences Research Institute. The prize recognizes “originality and innovation in the use of mathematical, statistical or computational methods for the study of the behavior of markets, and more broadly of economics.”

Dimitri Vayanos was elected a Fellow of the British Academy.

Eugene White was a visiting scholar at the Banque de France and a directeur d’études at the Ecole des Hautes Etudes en Sciences Sociales in Paris.

Heidi Williams received a Kauffman Junior Faculty Fellowship in Entrepreneurship Research, which recognizes researchers who “are beginning to establish a record of scholarship and exhibit the potential to make significant contributions to the body of research in the field of entrepreneurship.”

Conferences

Economics of Digitization

An NBER Conference on the “Economics of Digitization” took place in Palo Alto on March 6. NBER Research Associates Shane Greenstein of Northwestern University, Josh Lerner of Harvard University, and Scott Stern of MIT organized the program. These papers were discussed:

- **Samuel Fraiberger** and **Arun Sundararajan**, New York University, “Peer-to-Peer Rental Markets in the Sharing Economy”
- **Thomas Quan**, University of Minnesota, and **Kevin Williams**, Yale University, “Product Variety, Across-Market Demand Heterogeneity, and the Value of Online Retail”
- **Weijia Dai**, University of Maryland; **Ginger Zhe Jin**, University of Maryland and NBER; **Jungmin Lee**, Sogang University; and **Michael Luca**, Harvard University, “Optimal Aggregation of Consumer Ratings: An Application to Yelp.com” (NBER Working Paper No. [18567](#))
- **Erik Brynjolfsson**, MIT and NBER, and **Kristina McElheran**, University of Toronto, “Data in Action: Data-Driven Decision Making in U.S. Manufacturing”
- **Michela Giorcelli**, Stanford University, and **Petra Moser**, Stanford University and NBER, “Copyrights and Creativity: Evidence from Italian Operas”
- **Hong Luo**, Harvard University, and **Julie Mortimer**, Boston College and NBER, “Copyright Enforcement in Stock Photography”

Summaries of these papers may be found at: <http://www.nber.org/confer/2015/EoDs15/summary.html>



Program and Working Group Meetings

Labor Studies

The NBER’s Program on Labor Studies, directed by David Card of the University of California, Berkeley, met in San Francisco on February 20. These papers were discussed:

- **Hamish Low**, University of Cambridge; **Costa Meghir**, Yale University and NBER; **Luigi Pistaferri**, Stanford University and NBER; and **Alessandra Voena**, University of Chicago and NBER, “Marriage, Social Insurance, and Labor Supply”
- **Jesse Rothstein**, University of California, Berkeley, and NBER, “Revisiting the Impacts of Teachers”
- **Ioana Marinescu**, University of Chicago, and **Roland Rathelot**, University of Warwick, “Mismatch Unemployment and the Geography of Job Search”
- **Lance Lochner**, University of Western Ontario and NBER, and **Youngki Shin**, University of Western Ontario, “Understanding Earnings Dynamics: Identifying and Estimating the Changing Roles of Unobserved Ability, Permanent, and Transitory Shocks” (NBER Working Paper No. [20068](#))
- **Will Dobbie**, Princeton University and NBER, and **Jae Song**, Social Security Administration, “The Impact of Loan Modifications on Repayment, Bankruptcy, and Labor Supply: Evidence from a Randomized Experiment”
- **Alvaro Mezza**, Board of Governors of the Federal Reserve System, and **Moshe Buchinsky**, University of California, Los Angeles, and NBER, “Illegal Drugs, Education, and Labor Market Outcomes”
- **Henry Farber**, Princeton University and NBER, “Why You Can’t Find a Taxi in the Rain and Other Labor Supply Lessons from Cab Drivers” (NBER Working Paper No. [20604](#))

Summaries of these papers may be found at <http://www.nber.org/confer/2015/LSs15/summary.html>

Law and Economics

The NBER’s Law and Economics Program, directed by Christine Jolls of Yale University, met in Cambridge on February 20. These papers were discussed:

- **Megan Lawrence**, Harvard University; **Felix Oberholzer-Gee**, Harvard University and NBER; and **Victor Calanog**, Reis, Inc, “Bidding for Business: Tax Discrimination as Local Industrial Policy”
- **Bradley Larsen**, Stanford University and NBER, “Occupational Licensing and Quality: Distributional and Heterogeneous Effects in the Teaching Profession”
- **Lauren Cohen**, Harvard University and NBER; **Umit Gurun**, University of Texas at Dallas; and **Scott Duke Kominers**, Harvard University, “Patent Trolls: Evidence from Targeted Firms” (NBER Working Paper No. [20322](#))
- **Kathryn Spier**, Harvard University and NBER, and **J.J. Prescott**, University of Michigan, “Tailored Suits: Contracting on Litigation”
- **Andrew Daughety** and **Jennifer Reinganum**, Vanderbilt University, “Informal Sanctions on Prosecutors and Defendants and the Disposition of Criminal Cases”
- **Adair Morse**, University of California, Berkeley, and NBER, and **Wei Wang** and **Serena Wu**, Queen’s University, “Executive Gatekeepers: The Paradox of Lawyers in the Firm”



- **Benjamin Keys**, University of Chicago, and **Jialin Wang**, Consumer Financial Protection Bureau, “Minimum Payments and Debt Paydown in Consumer Credit Cards”
- **Charles Calomiris**, Columbia University and NBER; **Mauricio Larrain**, Columbia University; and **José Liberti** and **Jason Sturgess**, DePaul University, “How Collateral Laws Shape Lending and Sectoral Activity”
- **Will Dobbie**, Princeton University and NBER, and **Paul Goldsmith-Pinkham** and **Crystal Yang**, Harvard University, “Consumer Bankruptcy and Financial Health”

Summaries of these papers may be found at <http://www.nber.org/confer/2015/LEs15/summary.html>

Insurance

The NBER’s Insurance Working Group, directed by Liran Einav of Stanford University and Kenneth Froot of Harvard University, met in Palo Alto on February 19 and 20. Part of the meeting was held jointly with the Industrial Organization Program. In addition to the papers marked with an (*) in the Industrial Organization summary, these papers were discussed:

- **Tatyana Deryugina** and **Barrett Kirwan**, University of Illinois at Urbana-Champaign, “Does the Samaritan’s Dilemma Matter? Evidence from U.S. Agriculture”
- **Zarek Brot-Goldberg**, University of California, Berkeley; **Amitabh Chandra**, Harvard University and NBER; **Benjamin Handel**, University of California, Berkeley, and NBER; and **Jonathan Kolstad**, University of Pennsylvania and NBER, “Consumer Heterogeneity and Medical Care Price Responsiveness: Evidence and Implications for Optimal Insurance Design”
- **Daniel Bauer** and **George Zanjani**, Georgia State University, “The Marginal Cost of Risk and Capital Allocation in a Multi-Period Model”
- **Amanda Kowalski**, Yale University and NBER, “What Do Longitudinal Data on Millions of Hospital Visits Tell Us about the Value of Public Health Insurance as a Safety Net for the Young and Privately Insured?”
- **Eduardo Azevedo** and **Daniel Gottlieb**, University of Pennsylvania, “Perfect Competition in Markets with Adverse Selection”
- **Marika Cabral** and **Michael Geruso**, University of Texas at Austin and NBER, and **Neale Mahoney**, University of Chicago and NBER, “Does Privatized Health Insurance Benefit Patients or Producers? Evidence from Medicare Advantage” (NBER Working Paper No. [20470](#))
- **Saurabh Bhargava** and **George Loewenstein**, Carnegie Mellon University, and **Justin Sydnor**, University of Wisconsin, “Choose to Lose? Employee Health-Plan Decisions from a Menu with Dominated Options”
- **Johannes Jaspersen**, **Andreas Richter**, and **Sebastian Soika**, Ludwig-Maximilians-Universität München, “On the Demand Effects of Rate Regulation — Evidence from a Natural Experiment”

Summaries of these papers may be found at <http://www.nber.org/confer/2015/INs15/summary.html>

Industrial Organization

The NBER’s Program on Industrial Organization, directed by Jonathan Levin of Stanford University, met in Palo Alto on February 20 and 21. NBER Research Associates Michael Dickstein of Stanford University and Ali Hortaçsu of the University of Chicago organized the meeting. Part of the meeting was held jointly with the NBER’s Insurance Program, and papers marked with an (*) were presented to the joint session. These papers were discussed:

- ***Francesco Decarolis**, Boston University; **Maria Polyakova**, Stanford University; and **Stephen Ryan**, University of Texas at Austin and NBER, “The Welfare Effects of Supply-Side Regulations in Medicare Part D”



- ***Neale Mahoney**, University of Chicago and NBER, and **E. Glen Weyl**, Microsoft Corporation, “Imperfect Competition in Selection Markets” (NBER Working Paper No. [20411](#))
- ***Elisabeth Honka**, University of Texas at Dallas, and **Pradeep Chintagunta**, University of Chicago, “Simultaneous or Sequential? Search Strategies in the U.S. Auto Insurance Industry”
- **Gregory Crawford** and **Nicola Pavanini**, University of Zurich, and **Fabiano Schivardi**, LUISS Guido Carli, “Asymmetric Information and Imperfect Competition in Lending Markets”
- **Michael Sinkinson**, University of Pennsylvania, and **Amanda Starc**, University of Pennsylvania and NBER, “Ask Your Doctor? Direct-to-Consumer Advertising of Pharmaceuticals”
- **Anna Tuchman**, **Harikesh Nair**, and **Pedro Gardete**, Stanford University, “Complementarities in Consumption and the Consumer Demand for Advertising”
- **Nikhil Agarwal** and **Paulo Somaini**, MIT and NBER, “Demand Analysis Using Strategic Reports: An Application to a School Choice Mechanism” (NBER Working Paper No. [20775](#))
- **Christina Dalton**, Wake Forest University; **Gautam Gowrisankaran**, University of Arizona and NBER; and **Robert Town**, University of Pennsylvania and NBER, “Myopia and Complex Dynamic Incentives: Evidence from Medicare Part D”
- **Gregory Crawford**, University of Zurich; **Robin Lee**, Harvard University and NBER; **Michael Whinston**, MIT and NBER; and **Ali Yurukoglu**, Stanford University and NBER, “The Welfare Effects of Vertical Integration in Multichannel Television Markets”
- **Jean-Pierre Dubé**, University of Chicago and NBER; **Xueming Luo**, Temple University; and **Zheng Fang**, Sichuan University, “Self-Signaling and Prosocial Behavior: A Cause Marketing Mobile Field Experiment”
- **Daniel Björkegren**, Brown University, “The Adoption of Network Goods: Evidence from the Spread of Mobile Phones in Rwanda”

Summaries of these papers may be found at <http://www.nber.org/confer/2015/IOs15/summary.html>

Economic Fluctuations and Growth

The NBER’s Program on Economic Fluctuations and Growth, directed by Mark Gertler of New York University and Peter Klenow of Stanford University, met in San Francisco on February 27. NBER Research Associates Manuel Amador of the Federal Reserve Bank of Minneapolis and Andrea Eisfeldt of the University of California, Los Angeles, organized the meeting. These papers were discussed:

- **Pablo Kurlat**, Stanford University and NBER, “Asset Markets with Heterogeneous Information”
- **Johannes Stroebe**, New York University, and **Joseph Vavra**, University of Chicago and NBER, “House Prices, Local Demand, and Retail Prices” (NBER Working Paper No. [20710](#))
- **Daniel Greenwald**, New York University; **Martin Lettau**, University of California, Berkeley, and NBER; and **Sydney Ludvigson**, New York University and NBER, “Origins of Stock Market Fluctuations” (NBER Working Paper No. [19818](#))
- **Fatih Guvenen**, University of Minnesota and NBER; **Fatih Karahan**, Federal Reserve Bank of New York; **Serdar Ozkan**, University of Toronto; and **Jae Song**, Social Security Administration, “What Do Data on Millions of U.S. Workers Reveal about Lifecycle Earnings Risk?”
- **Philippe Martin**, Sciences Po, and **Thomas Philippon**, New York University and NBER, “Inspecting the Mechanism: Leverage and the Great Recession in the Eurozone” (NBER Working Paper No. [20572](#))



- **Rabah Arezki**, International Monetary Fund; **Valerie Ramey**, University of California, San Diego, and NBER; and **Liugang Sheng**, Chinese University of Hong Kong, “News Shocks in Open Economies: Evidence from Giant Oil Discoveries” (NBER Working Paper No. [20857](#))

Summaries of these papers may be found at <http://www.nber.org/confer/2015/EFGw15/summary.html>

EFJK Growth

The NBER’s EFJK Growth Group, organized by Ufuk Akcigit of the University of Pennsylvania and Benjamin Moll of Princeton University, met in San Francisco on February 26. These papers were discussed:

- **Loukas Karabarbounis** and **Brent Neiman**, University of Chicago and NBER, “Capital Depreciation and Labor Shares around the World: Measurement and Implications” (NBER Working Paper No. [20606](#))
- **Vasco Carvalho**, University of Cambridge, and **Nico Voigtländer**, University of California, Los Angeles, and NBER, “Input Diffusion and the Evolution of Production Networks”
- **Andrew Atkeson** and **Ariel Burstein**, University of California, Los Angeles, and NBER, “Aggregate Implications of Innovation Policy” (NBER Working Paper No. [17493](#))
- **Sînâ Ateş**, University of Pennsylvania, and **Felipe Saffie**, University of Maryland, “Fewer but Better: Sudden Stops, Firm Entry, and Financial Selection”
- **Diego Comin**, Dartmouth College and NBER; **Danial Lashkari**, Harvard University; and **Martí Mestieri**, Toulouse School of Economics, “Structural Change with Long-Run Income and Price Effects”

- **Benjamin Pugsley** and **Ayşegül Şahin**, Federal Reserve Bank of New York, “Grown-up Business Cycles”

Summaries of these papers may be found at <http://www.nber.org/confer/2015/EGCw15/summary.html>

Monetary Economics

The NBER’s Monetary Economics Program, directed by Christina Romer and David Romer of the University of California, Berkeley, met in Chicago on March 6. NBER Research Associates Janice Eberly of Northwestern University and Arvind Krishnamurthy of Stanford University organized the program. These papers were discussed:

- **Erik Hurst**, **Amit Seru**, and **Joseph Vavra**, University of Chicago and NBER, and **Benjamin Keys**, University of Chicago, “Regional Redistribution through the U.S. Mortgage Market”
- **Efraim Benmelech**, Northwestern University and NBER, and **Ralf Meisenzahl** and **Rodney Ramcharan**, Board of Governors of the Federal Reserve System, “The Real Effects of Liquidity During the Financial Crisis: Evidence from Automobiles”
- **Òscar Jordà**, Federal Reserve Bank of San Francisco; **Moritz Schularick**, University of Bonn; and **Alan Taylor**, University of California, Davis, and NBER, “Betting the House” (NBER Working Paper No. [20771](#))
- **Marco Del Negro**, Federal Reserve Bank of New York, and **Christopher Sims**, Princeton University and NBER, “When Does a Central Bank’s Balance Sheet Require Fiscal Support?”
- **Stefano Giglio**, University of Chicago and NBER; **Matteo Maggiori**, Harvard University and NBER; and **Johannes Stroebel**, New York University, “No-Bubble Condition: Model-Free Tests in Housing Markets” (NBER Working Paper No. [20154](#))
- **Stefan Nagel**, University of Michigan and NBER, “The Liquidity Premium of Near-Money Assets” (NBER Working Paper No. [20265](#))

Summaries of these papers may be found at <http://www.nber.org/confer/2015/MEs15/summary.html>



Health Care

The NBER’s Health Care Program, directed by Jonathan Gruber of MIT, met in Cambridge on March 6. These papers were discussed:

- **Emily Oster**, Brown University and NBER, “Diabetes and Diet: Behavior Change and the Value of Health”
- **Maria Polyakova**, Stanford University, “Regulation of Insurance with Adverse Selection and Switching Costs: Evidence from Medicare Part D”
- **Matthew Grennan**, University of Pennsylvania, and **Ashley Swanson**, University of Pennsylvania and NBER, “Transparency and Negotiated Prices: The Value of Benchmarking in Hospital-Supplier Bargaining”
- **Zack Cooper** and Stuart Craig, Yale University; **Martin Gaynor**, Carnegie Mellon University and NBER; and **John Van Reenen**, London School of Economics and NBER, “Why is Health Care Spending on the Privately Insured in Grand Junction, Colorado, So High? Prices, Competition, and Health Care Spending”
- **David Powell**, RAND Corporation, and **Seth Seabury**, University of Southern California, “Medical Care Spending and Labor Market Outcomes: Evidence from Workers’ Compensation Reforms”
- **Benjamin Handel**, University of California, Berkeley, and NBER; **Jonathan Kolstad**, University of Pennsylvania and NBER; **Amitabh Chandra**, Harvard University and NBER; and **Zarek Brot-Goldberg**, University of California, Berkeley, “What Does a Deductible Do? The Impact of Cost-Sharing on Health Care Prices, Quantities, and Spending Dynamics”

Summaries of these papers may be found at <http://www.nber.org/confer/2015/HCs15/summary.html>

Development of the American Economy

The NBER’s Program on the Development of the American Economy, directed by Claudia Goldin of Harvard University, met in Cambridge on March 7. These papers were discussed:

- **Karen Clay**, Carnegie Mellon University and NBER; **Joshua Lewis**, Université de Montréal; and **Edson Severnini**, Carnegie Mellon University, “Benefits and Costs of Electricity Pre-Clean Air Act”
- **B. Zorina Khan**, Bowdoin College and NBER, “Invisible Women: Entrepreneurship, Innovation, and Family Firms in France during Early Industrialization” (NBER Working Paper No. [20854](#))
- **Daniel Fetter**, Wellesley College and NBER, and **Lee Lockwood**, Northwestern University and NBER, “Means-Tested Old Age Support and Private Behavior: Evidence from the Old Age Assistance Program”
- **Andrew Goodman-Bacon**, University of California, Berkeley, “Public Insurance and Mortality: Evidence from Medicaid Implementation”
- **Felipe Gonzalez**, University of California, Berkeley; **Guillermo Marshall**, University of Illinois at Urbana-Champaign; and **Suresh Naidu**, Columbia University and NBER, “Start-up Nation? Slave Wealth and Entrepreneurship in Civil War Maryland”
- **Emily Nix**, Yale University, and **Nancy Qian**, Yale University and NBER, “The Fluidity of Race: ‘Passing’ in the United States, 1880–1940” (NBER Working Paper No. [20828](#))
- **Michael Huberman**, Université de Montréal; **Christopher Meissner**, University of California, Davis, and NBER; and **Kim Oosterlinck**, Université Libre de Bruxelles, “Technology and Geography in the Second Industrial Revolution: New Evidence from the Margins of Trade” (NBER Working Paper No. [20851](#))

Summaries of these papers may be found at <http://www.nber.org/confer/2015/DAEs15/summary.html>

Bureau Books

For information on ordering and electronic distribution, see <http://www.press.uchicago.edu/books/orders.html>, or to place an order you may also contact the University of Chicago Press Distribution Center, at
Telephone: 1-800-621-2736
Email: orders@press.uchicago.edu

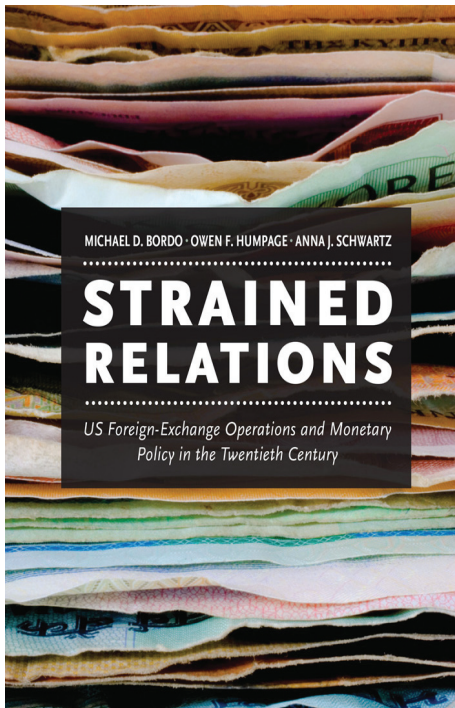
Strained Relations: U.S. Foreign-Exchange Operations and Monetary Policy in the Twentieth Century

Michael D. Bordo, Owen F. Humpage, and Anna J. Schwartz
Cloth: \$97.50
A National Bureau of Economic Research Monograph

During the twentieth century, foreign-exchange intervention was sometimes used in an attempt to solve the fundamental trilemma of international finance, which holds that countries cannot simultaneously pursue independent monetary policies, stabilize their exchange rates, and benefit from free cross-border financial flows. Drawing on a trove of previously confidential data, *Strained Relations* reveals

the evolution of U.S. policy regarding currency market intervention, and its interaction with monetary policy. The authors consider how foreign-exchange intervention was affected by changing economic and institutional circumstances — most notably the abandonment of the international gold standard — and how political and bureaucratic factors affected this aspect of public policy.

<http://www.nber.org/books/bord12-1>



Economic Analysis of the Digital Economy

Edited by Avi Goldfarb, Shane M. Greenstein, and Catherine E. Tucker
Cloth: \$130
A National Bureau of Economic Research Conference Report

As the cost of storing, sharing, and analyzing data has decreased, economic activity has become increasingly digital. But while the effects of digital technology and improved digital communication have been explored in a variety of contexts, the impact on economic activity — from consumer and entrepreneurial behavior to the ways in which governments determine policy — is less well understood.

Economic Analysis of the Digital Economy explores the economic impact of digitization, with each chapter identifying a promising new area of research. The Internet is one of the key drivers of growth in digital communica-

tion, and the first set of chapters discusses basic supply-and-demand factors related to access. Later chapters discuss new opportunities and challenges created by digital technology and describe some of the most pressing policy issues. As digital technologies continue to gain in momentum and importance, it has become clear that digitization has features that do not fit well into traditional economic models. This suggests a need for a better understanding of the impact of digital technology on economic activity, and *Economic Analysis of the Digital Economy* brings together leading scholars to explore this emerging area of research.

<http://www.nber.org/books/gree13-1>



NBER*Reporter*

NATIONAL BUREAU OF ECONOMIC RESEARCH

**1050 Massachusetts Avenue
Cambridge, Massachusetts 02138-5398
(617) 868-3900**

Change Service Requested

Nonprofit Org.
U.S. Postage
PAID
National Bureau of
Economic Research