

- The Effect of Default Options on Retirement Savings
- Does Medical Care Reduce Disability? The Case of Cardiovascular Disease
- The Effect of Depression on Retirement and Disability Insurance Applications

ALSO: Short Abstracts of Recent NBER Working Papers — see page 5

NBER NATIONAL BUREAU OF ECONOMIC RESEARCH

BULLETIN ON AGING AND HEALTH

The Effect of Default Options on Retirement Savings

Many workers in the U.S. and around the world have defined contribution retirement savings plans, either through their employers or as part of the social security system. Workers covered by these plans typically must make a number of decisions about the plan, which may include whether to participate, how much to contribute, how to allocate plan assets across various investment vehicles, and how to decumulate assets following retirement.

For each of these decisions, there is usually a default option; for example, it could be that workers are not enrolled in the plan unless they opt in or that plan assets are invested in a money market fund unless workers select a different asset allocation. Standard economic theory suggests that defaults should have little effect on retirement savings outcomes — if the default option is not the best choice for the worker, he will simply switch to his preferred option, as long as switching is not particularly costly.

In practice, however, defaults seem to matter a great deal. This is the conclusion of researchers **John Beshears, James Choi, David Laibson, and Brigitte Madrian** in “**The Importance of Default Options for Retirement Savings Outcomes: Evidence from the United States**” (NBER Working Paper 12009). The authors look at the effect of defaults on participa-

tion, contribution rates, asset allocation, and post-retirement distributions, as well as consider some of the explanations for the persistence of defaults.

Most employer-provided pension plans in the U.S. have standard enrollment, where workers must opt in if they wish to participate. However, some plans have automatic enrollment, where workers instead must opt out if they do not wish to participate. The authors find that having automatic enrollment leads workers to join the plan at a much faster rate. In one firm that switched from standard to automatic enrollment for new hires, the plan participation rate was 35 percentage points higher after three months on the job under automatic enrollment, and remained 25 points higher after two years.

The authors next examine the choice of how much to contribute and find that here too, defaults matter. In one firm with a default contribution rate of 3 percent of salary, more than one-quarter of workers contributed exactly that amount to the plan, despite the existence of a dollar-for-dollar employer match on contributions up to 6 percent of salary. Once the firm switched to a 6 percent default, virtually no new hires selected a 3 percent contribution rate.

Defaults affect asset allocation as well. The authors look at the

The NBER Bulletin on Aging and Health summarizes selected Working Papers recently produced as part of the Bureau's program of research in aging and health economics. You can sign up to receive new Bulletin issues and can access current and past issues electronically, at no cost, by going to: <http://www.nber.org/aginghealth>

experience of one firm that switched from standard to automatic enrollment, where only workers hired under automatic enrollment had a default investment fund. They find that fully one-third of workers hired under automatic enrollment invested all of their assets in the default fund, a choice made by virtually no workers hired under standard enrollment.

The authors also discuss the evidence on defaults and the decumulation of assets after workers leave their jobs. Defaults have been shown to affect whether a young worker takes his account balances as a cash distribution or keeps it invested in a retirement account, and also whether an older worker takes his account balances as a single or joint life annuity. Thus defaults are extremely influential at every stage of retirement plan decision-making — participation, contributions, asset allocation, and decumulation.

Next, the authors discuss some possible explanations for the persistence of defaults. One explanation is

the complexity of making retirement plan decisions. Surveys of financial literacy find that many individuals lack basic financial knowledge about concepts like risk or compounding. The psychology literature has established that individuals are more likely to put off making decisions as the complexity of the decision increases. Defaults that simplify retirement decision-making can thus encourage participation. A second possible explanation is that some individuals have problems with self-control, which may lead them to postpone enrolling in the plan or to make other decisions that are inconsistent with their long-term goals. A third explanation is that individuals perceive the default as an endorsement of a particular course of action.

The evidence indicates that all

of these factors contribute to the importance of defaults. For instance, “quick enrollment,” which requires individuals to opt in to the plan but offers a pre-set contribution rate and asset allocation, generates a higher participation rate than standard enrollment but a lower participation rate than automatic enrollment. This shows that simplifying decision-making is helpful, but that self-control problems also play a role. There is also substantial evidence for an endorsement effect—for example, workers are more likely to allocate their own contributions to company stock when the employer match is made in company stock.

The importance of defaults combined with the trend towards more defined contribution retirement plans suggests that the actions

of policy makers can have a large impact on retirement savings outcomes. There are many examples of existing public policies that encourage retirement savings, such as the well-diversified default asset allocation in the Swedish pension system. But there are also policies that discourage savings, such as the regulation allowing employers to compel a cash distribution of plan assets for departing employees when assets are less than \$5,000. As the authors conclude, “defaults are not neutral—they can either facilitate or hinder better savings outcomes.”

The authors acknowledge financial support from the National Institute on Aging (grant R01-AG021650 and T32AG00186) and the Social Security Administration (grant 10-P-98363-1).

Does Medical Care Reduce Disability? The Case of Cardiovascular Disease

People in the U.S. are not only living longer than in the past, they are also healthier at older ages. Over the past two decades, disability among the elderly has declined dramatically—the share of the elderly population reporting difficulty with activities of daily living (ADLs) fell from 25 percent in 1984 to 20 percent in 1999, a decline of one-fifth.

Although these facts are well-established, their causes and consequences are less clear. Is the reduction in disability due to improved medical care, or is it the result of individual behavioral changes or environmental modifications that allow the elderly to better function by themselves? What are the long-run health and financial impacts of declining disability rates?

These questions are taken up by authors **David Cutler**, **Mary Beth Landrum**, and **Kate Stewart** in “**Intensive Medical Care and Cardiovascular Disease Disability Reductions**” (NBER Working Paper 12184). The authors focus on a single

health condition in order to be able to better analyze health shocks and their consequences. It is natural to focus on cardiovascular disease, which is both the most common cause of death in the U.S. and the condition with the highest total medical expenditures. The data for the analysis comes from the National Long-Term Care Survey, a survey of people aged 65 and over that includes linked Medicare claims data.

The authors begin by assessing the role of cardiovascular disease in the recent reduction in disability rates. They find that the probability of being disabled as a result of cardiovascular disease fell by about one percentage point from 1989 to 1999, accounting for 14 to 22 percent of the total decline in disability during the period.

Next, the authors explore why the cardiovascular disability rate fell. The share of the population disabled by cardiovascular disease depends on the probability of experiencing an event such as a heart attack, the probability of surviving such an event, and the

probability that a survivor will be disabled. A decrease in any of these probabilities will lower the disability rate in the population. Examining the changes in these probabilities over time, the authors find that the probability of an event has remained relatively constant over time and the survival rate has increased, while the disability rate of survivors has dropped sharply. The latter effect thus explains the overall drop in cardiovascular disability rates.

Why are today’s survivors of cardiovascular events healthier than their predecessors? One explanation is advances in medical treatment, including drugs such as beta-blockers and ace-inhibitors that reduce the workload on the heart and surgical interventions such as angioplasty.

To estimate the role of medical care in reducing cardiovascular disability, the authors estimate models in which the individual’s health status following a cardiovascular event—dead, alive and disabled, or alive and non-disabled—is a function of the aver-

age treatment rate in the geographic area in which he lives. This strategy takes advantage of variation in medical treatment within areas over time. Importantly, the authors do not use the actual treatment received by the patient in their model, as this likely depends on the physician's perception of the patient's underlying health, which will be correlated with the patient's outcome.

The authors find that the increased use of effective treatments contributed to the decline in disability and death among cardiovascular disease patients between 1984 and 1999. The results are strongest for ischemic heart disease, where increases in medical treatment can explain over half of the decline in

disability and two-thirds of the decline in mortality. Expansion in medical treatment also led to reduced disability and death from stroke, heart failure and arrhythmia, and other circulatory diseases.

How do the benefits of reduced disability compare to the costs of expanded medical treatment? The authors estimate that the increase in quality-adjusted life expectancy associated with not being disabled is 3.7 years. Using the standard assumption that a year of life in good health is worth \$100,000 and discounting future values, the authors estimate the value of disability prevention to be \$316,000.

On the cost side, they find that the average cost of treatment for patients

experiencing a cardiovascular event is about \$8,000 higher when they receive relevant procedures than when they do not. However, Medicare spending is lower for non-disabled than for disabled beneficiaries, suggesting that higher treatment costs today may be offset by lower future medical spending.

An important question left for future research is whether these results generalize to other medical conditions. But as the authors conclude, "by virtually any measure, medical technology after acute cardiovascular episodes is worth the cost."

The authors acknowledge funding from the National Institute on Aging and the Lasker Foundation.

The Effect of Depression on Retirement and Disability Insurance Applications

Poor health has long been established as one of the most critical determinants of retirement behavior. Yet the existing literature has focused primarily on the role of physical illness. Since the early 1990s, mental illnesses have been the fastest-growing source of claims for Disability Insurance (DI) and Supplemental Security Insurance (SSI) benefits, particularly among people aged 45–64. This suggests that poor mental health may also be an important factor in retirement decisions.

Understanding the effect of one important mental health condition, depression, on the labor supply of older workers is the subject of a new study by **Rena Conti, Ernst Berndt, and Richard Frank, "Early Retirement and Public Disability Insurance Applications: Exploring the Impact of Depression"** (NBER Working Paper 12237).

The authors hypothesize that depression may reduce labor supply directly by reducing individuals' ability to work and interest in employment and indirectly by magnifying the effect of physical illness and other life events. In their analysis, they focus on three outcomes: employment status,

early retirement, and application for DI or SSI benefits. The data for the analysis comes from the Health and Retirement Study (HRS). They identify depression using the CES-D, a self reported survey instrument designed to detect depression symptomology in the general population.

The authors first provide some summary statistics on depression. Among HRS respondents who were physically healthy and still in the labor force in 1994, about 6% of men and 12% of women were depressed at the 1994 baseline. Depression is more common among individuals who are Hispanic, poor, and lacking a high school education. Depressed individuals are more likely to experience a physical health shock in the future.

The authors' first empirical approach is to identify the direct effect of depression by comparing the subsequent employment outcomes of individuals who are depressed at baseline with those of individuals who are not depressed. They also interact baseline depression status with a subsequent health or other life shock to identify the indirect effect of depression on employment.

They find that depression increases the probability of DI/SSI application by 8 percentage points for men and 10 points for women. The magnitude of these effects are larger than the effects of physical health shocks. They also find evidence of an indirect effect of depression, as depression magnifies the effect of physical health and widowhood shocks.

In their analysis of labor supply, the authors find that depression increases the probability of retiring before age 65. The effect is smaller than that of physical health shocks but not small—for men, depression increases the probability of early retirement by 27 percentage points. Depression does not amplify the effect of a physical health shock on retirement, but does magnify the effect of widowhood.

The authors' second empirical approach is to identify a subset of individuals with no history of psychiatric conditions and no significant symptoms of depression at baseline and to estimate the effect of a subsequent depression onset on labor market outcomes. Here they find that depression increases the probability of a DI/SSI application by 16 percentage points for men and

18 points for women. Depression and physical health shocks have similar and large effects on the probability of early retirement. Depression magnifies the effect of physical health shocks for both men and women and of widowhood shocks for men.

Overall, the results from both strategies indicate that depression has both direct and indirect effects on DI/SSI applications and early retirement, after controlling for other determinants of labor force exit. The magnitude of the effects is similar to that of

physical illness alone.

These findings have a number of important policy implications. First, they suggest a significant role for mental illness in explaining recent trends in early retirement and public disability applications. Second, after accounting for the interaction between mental and physical illness, disability rates associated with physical illness may be decreasing faster than previous research suggests. This also implies a more nuanced interpretation of the official disability insurance statistics. Finally, effective

and cost effective treatments for major depression are widely available. Insuring access to treatment and continuity of treatment for individuals suffering from a mental illness may have important effects on employment and public disability programs. As the authors note, “the impact of treatment receipt on individuals’ lives may be substantial.”

The authors acknowledge funding from the National Institute of Aging, the National Institute of Mental Health, and the Lasker Family Charitable Trust.

NBER Profile: Jonathan Gruber

Jonathan Gruber is a Research Associate and the Director of the Program on Children at the NBER. He is also affiliated with the NBER’s programs on Aging, Health Care, Health Economics, Labor Studies, Public Economics, and Education.

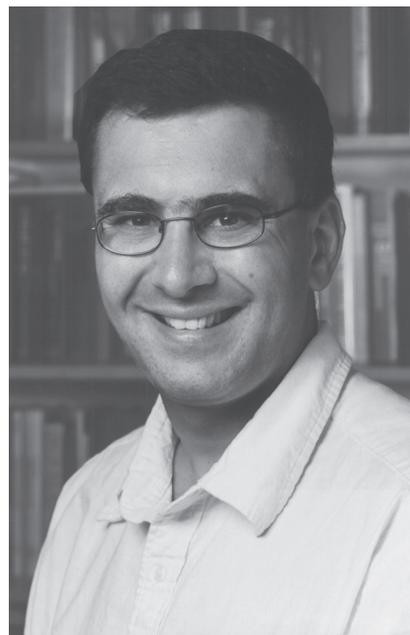
Gruber is a Professor of Economics at MIT, where he has taught since 1992. He is an elected member of the Institute of Medicine, as well as an Associate Editor of the *Journal of Health Economics* and a co-editor of the *Journal of Public Economics*. He has received numerous awards, including the American Society of Health Economics Inaugural Medal for the best health economist in the nation aged 40 and under, a FIRST award from the National Institute on Aging, and the National Science Foundation’s Presidential Faculty Fellow Award.

In 1997–98, he served as Deputy Assistant Secretary for Economic Policy at the Treasury Department.

He received a B.S. in Economics from MIT and a Ph.D. in Economics from Harvard University.

Dr. Gruber’s research focuses on areas of public finance and health economics. Some of his recent work has explored the effect of Social Security on retirement and living arrangements, the demand for cigarettes, and the link between health insurance premiums and insurance coverage.

Gruber lives in Lexington, Massachusetts with his wife Andrea and his three children Sam (12), Jack (9) and Ava (7). Any time not spent at work or with his family is devoted to playing tennis, reading fiction, and obsessively following professional sports.



Announcing Free CD of NBER Working Papers

We are pleased to offer NBER Working Papers on NIA-funded research in aging and health free on CD. The CD, which will be updated twice a year, includes more than 125 papers from 2002–2006, along with Content Lists arranged by title, by author, and by date. To request a free copy, go to <http://www.nber.org/programs/ag/datacd.html> or contact Janet Stein at (617) 588-0366 or jbstein@nber.org.

A complete list of all NBER Working Papers, with searchable abstracts, and the full texts of Working Papers issued since November 1994 are available at <http://www.nber.org/wwp.html> to anyone located at a university or other organization that subscribes to the (hard copy) Working Paper series.

Abstracts of Selected Recent NBER Working Papers

WP 12040

**David M. Cutler, Mary Beth Landrum,
Kate A. Stewart**

How Do the Better Educated Do It? Socioeconomic Status and the Ability to Cope with Underlying Impairment

There is a pronounced gradient in disability across socioeconomic groups, with better educated and higher income groups reporting substantially less disability. In this paper, we consider why that is the case, focusing on impairments in basic physical and cognitive aspects of living for the elderly. Our empirical work has two parts. First, we consider how much of this gradient in disability is a result of underlying differences in functioning versus the ability to cope with impairments. We show differences in functioning are the major part of the difference in disability, but both are important. Second, we consider how the better educated elderly cope with disability. Better educated people use substantially more assistive technology than the less educated and are more likely to use paid help. But use of these services is not the primary reason that the better educated are better able to cope. We conclude with thoughts about other potential factors that may explain differential coping.

WP 12048

Joanna Lahey

State Age Protection Laws and the Age Discrimination in Employment Act

Some anti-discrimination laws have the perverse effect of harming the very class they were meant to protect. This paper provides evidence that age discrimination laws belong to this perverse class. Prior to the enforcement of the federal law, state laws had little effect on older workers, suggesting that firms either knew little about these laws or did not see them as a threat. After the enforcement of the federal Age Discrimination in Employment Act (ADEA) in 1979, white male workers over the age of 50 in states with age discrimination laws worked between 1 and 1.5 fewer weeks per year than workers in states without laws. These men are also .3 percentage points more likely to be retired and .2 percentage points less likely to be hired. These findings suggest that in an anti-age discrimination environment, firms seek to avoid litigation through means not intended by the legislation—by not employing older workers in the first place.

WP 12057

Michael D. Hurd, Susann Rohwedder Some Answers to the Retirement-Con- sumption Puzzle

The simple one-good model of life-cycle consumption requires “consumption smoothing.” According to previous results based on partial spending and on synthetic panels, British and U.S. households apparently reduce consumption at retirement. The reduction cannot be explained by the simple one-good life-cycle model, so it has been referred to as the retirement-consumption puzzle. An interpretation is that at retirement individuals discover they have fewer economic resources than they had anticipated prior to retirement, and as a consequence reduce consumption. This interpretation challenges the life-cycle model where consumers are assumed to be forward-looking. Using panel data, we find that prior to retirement workers anticipated on average a decline of 13.3% in spending and after retirement they recollected a decline of 12.9%: widespread surprise is not the explanation for the retirement-consumption puzzle. Workers with substantial wealth both anticipated and recollected a decline. Therefore, for many workers the decline is not necessitated by the fall in income that accompanies retirement. Poor health is associated with above-average declines. At retirement time spent in activities that could substitute for market-purchased goods increases. Apparently a number of factors contribute to the decline in spending, which, for most of the population, can be accommodated in conventional models of economic behavior.

WP 12080

Alan M. Garber, Charles I. Jones, Paul M. Romer Insurance and Incentives for Medical In- novation

This paper studies the interactions between health insurance and the incentives for innovation. Although we focus on pharmaceutical innovation, our discussion applies to other industries producing novel technologies for sale in markets with subsidized demand. Standard results in the growth and productivity literatures suggest that firms in many industries may possess inadequate incentives to innovate. Standard results in the health literature suggest that health insurance leads to the overutilization of health care. Our study of innovation in the pharmaceutical industry emphasizes

the interaction of these incentives. Because of the large subsidies to demand from health insurance, limits on the lifetime of patents and possibly limits on monopoly pricing may be necessary to ensure that pharmaceutical companies do not possess excess incentives for innovation.

WP 12102

Christopher J. Ruhm

A Healthy Economy Can Break Your Heart

Panel data econometric methods are used to investigate how the risk of death from acute myocardial infarction (AMI) varies with macroeconomic conditions after controlling for demographic factors, fixed state characteristics, general time effects and state-specific time trends. The sample includes residents of the 20 largest states over the 1979 to 1998 period. A one percentage point reduction in unemployment is predicted to raise AMI mortality by 1.3 percent, with a larger increase in relative risk for 20–44 year olds than older adults, particularly if the economic upturn is sustained. Nevertheless, the much higher absolute AMI fatality rate of senior citizens implies that they account for most of the additional deaths. This suggests the importance of factors like air pollution and traffic congestion that increase with economic activity, are linked to coronary heart disease and may have particularly strong effects on vulnerable segments of the population, such as the frail elderly. AMI mortality risk quickly rises when the economy strengthens and increases further if the favorable economic conditions persist. This is consistent with strong effects of other short-term factors on heart attack risk and with health being a durable capital stock that is affected by flows of lifestyle behaviors and environmental conditions whose effects accumulate over time.

WP 12111

Karen Clay, Werner Troesken

Deprivation and Disease in Early Twenti- eth-Century America

This paper explores how early life exposure to poverty and want adversely affects later life health outcomes. In particular, it examines how exposure to crowded housing conditions and impure drinking water undermines long-term health prospects and increases the risk of age-related pathologies such as cancer, heart disease, kidney disease, and stroke. Exploiting city-level data from early-twentieth century

America, evidence is presented that cities with unusually high rates of typhoid fever in 1900 had elevated rates of heart and kidney disease fifteen years later; also cities with unusually high rates of tuberculosis in 1900 had elevated rates of cancer and stroke fifteen years later. The estimated coefficients suggest that eradicating typhoid fever (through water purification) and tuberculosis (through improved housing and nutrition) would have reduced later death rates from heart disease, cancer, stroke, and kidney disease by 23 to 35 percent.

WP 12113

Robert Kaestner, Xin Xu

Effects of Title IX and Sports Participation on Girls' Physical Activity and Weight

In this study, we examined the association between girls' participation in high school sports and the physical activity, weight, body mass and body composition of adolescent females during the 1970s when girls' sports participation was dramatically increasing as a result of Title IX. We found that increases in girls' participation in high school sports, a proxy for expanded athletic opportunities for adolescent females, were associated with an increase in physical activity and an improvement in weight and body mass among girls. In contrast, adolescent boys experienced a decline in physical activity and an increase in weight and body mass during the period when girls' athletic opportunities were expanding. Taken together, these results strongly suggest that Title IX and the increase in athletic opportunities among adolescent females it engendered had a beneficial effect on the health of adolescent girls.

WP 12123

Dhaval Dave, Inas Rashad, Jasmina

Spasojevic

The Effects of Retirement on Physical and Mental Health Outcomes

While numerous studies have examined how health affects retirement behavior, few have analyzed the impact of retirement on subsequent health outcomes. This study estimates the effects of retirement on health status as measured by indicators of physical and functional limitations, illness conditions, and depression. The empirics are based on six longitudinal waves of the Health and Retirement Study, spanning 1992 through 2003. To account for biases due to unobserved selection and endogeneity, panel data methodologies are used. These are augmented by counterfactual and specification checks to gauge the robustness and plausibility of the estimates. Results indicate that complete retirement leads to a 23–29 percent increase in difficulties associated with mobility and daily activities, an eight percent increase in illness conditions, and an 11 percent decline in mental health. With an aging population choosing to retire at earlier ages, both Social Security and Medicare face considerable shortfalls. Eliminating the embedded incentives in Social Security and many private pension plans, which discourage work beyond some point, and enacting policies that prolong the retirement age may be desirable, *ceteris paribus*. Retiring at a later age may lessen or postpone poor health outcomes for older adults, raise well-being, and reduce the utilization of health care services, particularly acute care.

WP 12124

David M. Cutler, Edward L. Glaeser

Why Do Europeans Smoke More than Americans?

While Americans are less healthy than Europeans along some dimensions (like obesity), Americans are significantly less likely to smoke than their European counterparts. This difference emerged in the 1970s and it is biggest among the most educated. The puzzle becomes larger once we account for cigarette prices and anti-smoking regulations, which are both higher in Europe. There is a non-monotonic relationship between smoking and income; among richer countries and people, higher incomes are associated with less smoking. This can account for about one-fifth of the U.S./Europe difference. Almost one-half of the smoking difference appears to be the result of differences in beliefs about the health effects of smoking; Europeans are generally less likely to think that cigarette smoking is harmful.

WP 12147

David N. Weil

Population Aging

Population aging is primarily the result of past declines in fertility, which produced a decades long period in which the ratio of dependents to working age adults was reduced. Rising old-age dependency in many countries represents the inevitable passing of this "demographic dividend." Societies use three methods to transfer resources to people in dependent age groups: government, family, and personal saving. In developed countries, families are predominant in supporting children, while government is the main source of support for the elderly. The most important means by which aging will affect aggregate output is the distortion from taxes to fund PAYGO pensions.

NBER

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 are:

Martin Feldstein — President and Chief Executive Officer

Susan Colligan — Vice President for Administration and Budget

Elizabeth E. Bailey — Chairman

John S. Clarkeson — Vice Chairman

Contributions to the National Bureau are tax deductible. Inquiries concerning the contributions may be addressed to Martin Feldstein, President, NBER, 1050 Massachusetts Avenue, Cambridge, MA 02138-5398.

The NBER Bulletin on Aging and Health summarizes selected Working Papers recently produced as part of the Bureau's program of research. Working Papers are intended to make preliminary research results available to economists in the hope of encouraging discussion and suggestions for revision.

The Bulletin is issued for similar informational purposes and to stimulate discussion of Working Papers before their final publication. Neither the Working Papers nor the Bulletin has been reviewed by the Board of Directors of the NBER.

The Bulletin is not copyrighted and may be reproduced freely with appropriate attribution of source. Please provide the NBER's Public Information Department with copies of anything reproduced.

Individual copies of the NBER Working Papers summarized here (and others) are available free of charge to Corporate Associates. For all others, there is a charge of \$5.00 per downloaded paper or \$10.00 per hard copy paper. Outside of the United States, add \$10.00 per order for postage and handling. Advance payment is required on all orders. To order, call the Publications Department at (617) 868-3900 or visit www.nber.org/papers. Please have the Working Paper Number(s) ready.

Subscriptions to the full NBER Working Paper series include all 700 or more papers published each year. Subscriptions are free to Corporate Associates. For others within the United States, the standard rate for a full subscription is \$3200; for academic libraries and faculty members, \$2300. Higher rates apply for foreign orders. The on-line standard rate for a full subscription is \$1750 and the on-line academic rate is \$725.

Partial Working Paper subscriptions, delineated by program, are also available. For further information, see our Web site, or please write: National Bureau of Economic Research, 1050 Massachusetts Avenue, Cambridge, MA 02138-5398.

Requests for Bulletin subscriptions, changes of address, and cancellations should be sent to Bulletin, NBER, 1050 Massachusetts Avenue, Cambridge, MA 02138-5398. Please include the current mailing label.