

National Bureau of Economic Research (NBER) (Ed.)

Periodical Part

NBER Reporter Online, Volume 1996

NBER Reporter Online

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Suggested Citation: National Bureau of Economic Research (NBER) (Ed.) (1996) : NBER Reporter Online, Volume 1996, NBER Reporter Online, National Bureau of Economic Research (NBER), Cambridge, MA

This Version is available at:

<https://hdl.handle.net/10419/62095>

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NBER *Reporter*

NATIONAL BUREAU OF ECONOMIC RESEARCH

SUMMER 1996

In This Issue

Program Report:
The Economics of Aging 1

Research Summaries:
Multinational Firms and
the Diffusion of Skills
and Technology 11
Seasonal Fluctuations
and Business Cycles 13

NBER Profiles 16
Conferences 19
Bureau News 27
Bureau Books 39
Current Working Papers 41

Program Report

The Economics of Aging

David A. Wise*

The central goal of the NBER's Program on the Economics of Aging is to develop a better understanding of the issues that are of particular importance to individuals as they age and to a society that is composed increasingly of older people. Over the past several years, we have focused on three areas: 1) the financial well-being of the elderly, with special emphasis on saving for retirement; 2) the labor force participation of older Americans, with substantial analysis of the role of employer-provided pension plans and Social Security provisions in encouraging early retirement; and 3) the role of housing, both as a potential source of financial support after retirement and in the determination of living arrangements as people age. More recently, we have sought to understand the reasons for the rapid growth in the cost of medical care, as well as the benefits of that care. (The economics of aging program and the health care program have been coordinated closely under the "Aging and Health Care Programs" that I oversee. Details of work in the health care program were reported by Alan M. Garber in the Winter 1995/6 issue of the *Reporter*.)

The NBER's Program on the Economics of Aging began in 1986. Since that time, it has included a large number of research projects, many of them integrated as part of coordinated investigations. Indeed, the program has developed primarily around these large coordinated research projects that are structured to address simultaneously several interrelated issues in the economics of aging. Central infrastructure for the program now is provided through a National Institute on Aging (NIA) "Center for Aging and Health Research" at the NBER. The Center has been instrumental in maintaining and expanding data files that support a broad array of ongoing research projects. There has been a particular focus on acquiring health care data that are used to support health care research within our program.

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NBER Reporter

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The Center also promotes research abroad on the economics of aging and facilitates coordinated international projects. One ongoing project on international social security, coordinated by Jonathan Gruber and me, evaluates the effects of government-directed social security programs around the world on the labor force participation of older workers. The Center supports an emerging project, coordinated by David E. Bloom, on the implications of the government retirement program in South Africa. Further, we have an ongoing joint project with the Japan Center for Economic Research, which has focused on issues that are of common concern in Japan and the United States. Individual projects under this program have directed attention to saving and labor force issues in Canada, Germany, Taiwan, and several other countries.

Much effort also has been directed to attracting young researchers to the economics of aging. To this end, our NIA Fellowship Program each year provides fellowships to two or three graduate students who are engaging in research on the economics of aging. In addition, it provides two or three postdoctoral fellowships each year to young professors, enabling them to spend a year at the NBER to do research on issues in the economics of aging and health care. The postdoctoral fellows in the past two years were: Dora L. Costa, MIT; Hilary W. Hoynes, University of California, Berkeley; Brigitte C. Madrian, University of Chicago; Kathleen M. McGarry, University of California, Los Angeles; David O. Meltzer, University of Chicago; and Douglas O. Staiger, Harvard. The effort to attract young researchers to our program also is reflected in four recent NIH First Independent Research Support and Transition (FIRST) awards granted to young members of the economics of

aging research group: David M. Cutler, Mark B. McClellan, Gruber, and Madrian.

Much of our recent research on the health care of the aged is based on unique and very extensive Medicare claims files, and on employer-provided medical insurance claims files that have been amassed under the infrastructure of the aging program, including the Center for Aging and Health Research. McClellan has played the key role in developing the Medicare files, and he and I have put together the employer files. Current and future research also will rely heavily on the new Health and Retirement Survey (HRS) and the new Survey of Asset and Health Dynamics Among the Oldest Old (AHEAD). These longitudinal surveys are sponsored by the NIA, and are structured to support research on individuals over age 50, as they age through retirement and other life transitions. As new waves of these surveys are collected every two years, these data will provide a comprehensive picture of issues affecting the health and well-being of older Americans, and will be an important source of information for our research. Although research under our program has been funded through a wide range of sources, we have been aided especially by the broad support we received from the NIA.

Participants in the aging program have written over 200 papers. Some of these appear in a series of books published by the University of Chicago Press, including: *The Economics of Aging* (1989), *Issues in the Economics of Aging* (1990), *Topics in the Economics of Aging* (1992), *Studies in the Economics of Aging* (1994), *Aging in the United States and Japan: Economic Trends* (1994), *Advances in the Economics of Aging* (1996), and *The Economic Effects of Aging in the United States and Japan* (forth-

coming). I will now discuss a sample of our work.

Pension Plans, Health Insurance, and the Labor Market

The American population is aging rapidly, and individuals are living longer. Yet Americans are saving little, and older workers are leaving the labor force at younger and younger ages. The prospect is for a shrinking proportion of labor force participants supporting a growing fraction of retired persons. The trend is unlikely to be sustainable and will have to be addressed if the federal budget is to be brought into balance. It now seems clear that much of the decline in labor force participation can be attributed to the provisions of employer-provided pension plans, as well as to the provisions of Social Security. The goal of pension plans is to provide a means of support in retirement. Indeed, the plans have allowed employees to retire at earlier ages. But pension plans not only provide a means of support in retirement. Plan provisions that determine how prospective benefits increase or decrease with age (the "accrual" of benefits) can provide enormous incentives to work until a certain age and to take early retirement thereafter. As the cost of health insurance has increased, the availability of retiree health insurance also may have played an important role in retirement decisions.

Employer-Provided Pension Plans and Early Retirement

A series of studies that I did with Robin L. Lumsdaine and James H. Stock demonstrated the dramatic effect of defined-benefit pension plan provisions on retirement behavior.

The accrual of benefits under these plans typically provides large financial incentives to continue working at some ages and to retire at other ages. These incentives generally encourage early retirement and penalize continuation in the labor force at older ages. For example, firm pension plans commonly provide a large increase in benefits at the early retirement age, which is often 55. Although employees become eligible for larger pension payments by continuing to work, the increase is rarely large enough to compensate for the delay in receiving benefits. This induces substantially younger retirement than would occur without the plans. The substantial effect of pension plan incentives on retirement behavior has been confirmed with data from several companies, as well as option value and dynamic programming models of retirement.¹ This series of studies also has shown that among workers covered by both Social Security and a typical employer pension plan, the effect of pension plan provisions on retirement age is far more significant than the effect of Social Security provisions. Indeed, the retirement of most employees covered by typical defined-benefit pension plans would be unaffected by planned changes in Social Security provisions, because a large fraction of these employees already have retired by the age at which those provisions become important. Those without employer plans would be affected; an increase in the Social Security early retirement age would have the greatest effect on employees without firm pension plans.

A study that I did with John Ainsink² examines the effects of compensation and pension arrangements on the decisions of Air Force pilots to retire from the military.

The option value model of retirement used in this study predicts retirement rates far more accurately than the "annualized cost of leaving model" that has been used by the military. For example, to encourage people to leave the military, the Air Force has instituted at least two incentive programs since 1992. Fewer officers than expected applied to either program. Applying the option value model, however, Ausink and I find that the effects of temporary annual retirement bonuses, such as Aviator Continuation Pay, are small. Indeed, the bonus amounts must be extremely large to induce departure rates that come close to Air Force objectives.

An apparent anomaly in the pattern of retirement ages is the high retirement rate at age 65. Lumsdaine, Stock, and I³ conclude that the high rate at this age cannot be explained entirely by the financial incentives inherent in pension plan and Social Security provisions. Nor can it be explained entirely by the availability of Medicare at age 65. We conclude that much of the high rate at age 65 must be attributed to a Social Security "age 65 normal retirement effect." To the extent that this is true, it implies that changing the normal retirement age could have effects on departure from the labor force, independent of changes in the financial incentives of the provisions.

New information that has been collected for the first time through the Health and Retirement Survey confirms the effects of employer-provided pension plans. The survey asks respondents a series of questions about the "subjective probabilities" of various events. One example is the likelihood that a person will work past age 62. Michael D. Hurd and McGarry find

that persons without defined-benefit pension plans are much more likely than those with such plans to say that they expect to work past age 62.⁴ Controlling for pension plan and health status, I find in addition that persons without retiree health insurance are more likely to say that they expect to work past age 62.⁵

Ongoing research is based primarily on data from the new Health and Retirement Survey. This resource will enable us to analyze much more varied retirement plan provisions than those from individual firm data, and to assess the joint effects of other worker characteristics, such as their health benefits, income and wealth from other sources, and health status.

Health Insurance and Labor Force Participation

In a series of papers, Gruber and Madrian considered the extent to which the availability of retiree health insurance influences retirement. Although the vast majority of working individuals aged 55–64 receive health insurance coverage through their employers, not all employers offer retiree health insurance. Employees who retire before age 65 without retiree health insurance face the prospect of going without insurance until they become eligible for Medicare at age 65, or of paying large premiums for individually purchased insurance. Thus persons without insurance may be less likely to retire than those who are covered by retiree health insurance. One study by Gruber and Madrian finds that state and federal continuation-of-coverage mandates (laws allowing individuals to continue purchasing employer health insurance for a specified number of months after

leaving the firm) lead to higher retirement rates.⁶ A study by Madrian compares the retirement behavior of men whose spouses are eligible for Medicare versus those who are not eligible.⁷ The results show that 55-to-69-year-old men with eligible spouses are much more likely to retire than those whose spouses are not eligible for Medicare. The implication is that the availability of health insurance for the spouse makes it less costly for the man to retire.

Another study by Madrian finds that employees at companies that provide retiree health insurance retire 5–16 months earlier than employees at companies without such insurance.⁸ This series of studies suggests a significant relationship between health insurance and retirement that is being evaluated further in ongoing research.

In a series of studies, Gruber and Madrian also consider the influence of health insurance on job mobility. The prospect that health insurance from a new employer may not continue existing-employer coverage, or may not cover pre-existing conditions, decreases voluntary job turnover by about one-fourth, from 16 percent to 12 percent per year.⁹ Another study finds that continuation-of-coverage mandates increase job mobility.¹⁰ One year of continuation benefits is associated with a 5 percent increase in mobility for those with health insurance. A third study confirms the effect of continuation of coverage, not only in increasing job mobility, but also in increasing the number of individuals who experience periods without a job.¹¹ This study also finds that continuation mandates increase the total amount of time spent unemployed.

In a related paper, Cutler and Madrian consider the effect of rising health insurance costs on hours

worked.¹² Specifically, they evaluate the extent to which employers respond to higher health insurance costs by hiring fewer workers who work for more hours, thereby economizing on the "fixed cost" of health insurance per worker. They estimate that the increasing cost of health insurance between 1980 and 1992 led to an average increase of one to two hours worked per worker per week.

Retirement Saving and Asset Accumulation

It often is presumed that support in retirement is provided by three legs: Social Security, employer-provided pensions, and personal saving. For most Americans, however, the first leg is very tall, the second leg is shorter, and the third leg barely clears the ground. Research on the financial status of older Americans that I conducted with James M. Poterba and Steven F. Venti finds that the median level of personal financial assets of those on the verge of retirement was only about \$7000 in 1991. However, contributions to personal retirement accounts have expanded very rapidly since the early 1980s when they were first introduced. Contributions to IRAs reached a peak of \$38 billion in 1985, and were made by 16 million individuals. Contributions fell by over 75 percent after the tax advantages were limited by the Tax Reform Act of 1986, and higher-income families virtually stopped contributing. Contributions to 401(k) plans, however, continued to grow, from zero in the early 1980s to over \$60 billion today, with over 20 million participants. Now, contributions to targeted retirement saving accounts exceed contributions to conventional employer-provided pension plans.

Thus this form of individual retirement saving is likely to have an increasingly important role in the support of future retirees.

The Saving Effect of IRA and 401(k) Programs

In a series of papers, Venti, Poterba, and I, and Venti and I have considered whether IRAs and 401(k) programs have added to personal saving. These studies find that IRA and 401(k) plans have added substantially to the net saving of contributors. Indeed, we find very little substitution between contributions to these accounts and saving in other forms. In a recent paper with Poterba and Venti, I show that as assets in these accounts grew between the early 1980s and the early 1990s, there was essentially no change in the other financial assets of contributors.¹³ We also find that, after controlling for income and other personal attributes, persons eligible for a 401(k) plan have accumulated substantially more in financial asset saving than those who are not eligible for such a plan, even though at the outset of the 401(k) program the two groups had essentially the same level of assets.

In a forthcoming paper¹⁴ that possibly may provide the best single evidence on the saving effect of IRA and 401(k) plans, Venti and I find that younger cohorts who reached a given age in a later year, and thus had more years to contribute to these plans, had substantially more in financial assets than older cohorts. The difference was explained entirely by contributions to these special saving programs. We found no differences between cohorts in non-IRA-401(k) saving. Venti and I conclude that the youngest cohorts in the analysis will have accumulated much more in person-

al financial assets by the time they retire than cohorts that are retiring now. These and the results of several other methods for inferring the effects of these programs are summarized in my research summary that appeared in the Fall 1995 issue of the *NBER Reporter*.

In an extensive compilation of the key evidence on IRA and 401(k) saving, Poterba, Venti, and I¹⁵ provide a detailed summary of a series of analyses. This paper involves the method used to control for saver heterogeneity, and also attempts to reconcile the results with the results of analyses by other researchers, which in some cases come to different conclusions. In addition, we present new results on the potential trade-off between IRA and 401(k) assets and housing equity, concluding that there is little systematic relationship between housing equity and saving in the special retirement saving accounts. We also present a detailed critique of the often-cited paper by Gale and Scholz, which concluded that IRA contributions were offset completely by a reduction in other saving. Based on our analysis of the data used by Gale and Scholz, including calculations based on a replication of their model, we conclude that their results are inconsistent with the raw data and cannot be supported by their formal model.

Extending this line of research to include international comparisons, Venti and I are studying the saving effect of Registered Retirement Saving Plans (RRSPs) in Canada.¹⁶ Like the IRA and 401(k) programs, the RRSP program is structured so that individuals deduct plan contributions from income for tax purposes. Interest accrues tax-free until withdrawal, when taxes are paid. RRSPs were first introduced in Canada in 1957.

They became a prominent form of saving in the early 1970s, and in 1992 accounted for about one-third of personal saving. Aggregate data on savings rates suggest that the divergence in previously similar Canadian and U.S. personal saving rates—when Canada's saving rate grew much faster than the U.S. saving rate—coincided with the growth of the RRSP program beginning in the early 1970s. Based primarily on cohort analysis, Venti and I conclude that RRSPs contributed substantially to personal saving in Canada, and for the most part did not substitute for other forms of saving.

A study by Leslie E. Papke, Mitchell Peterson, and Poterba¹⁷ reports the findings from a small survey of firms that provide 401(k) plans for their employees. The results suggest that few 401(k) plans replaced preexisting defined-benefit pension plans, although a substantial fraction replaced previous defined-contribution thrift and profit-sharing plans. The survey results also provide new evidence on patterns of 401(k) participation. The authors find significant persistence in firm-level participation rates from one year to the next, which supports the view that 401(k) participants are not making marginal decisions about whether to contribute to the plan in a given month, or even year, but rather make long-term commitments to participate in these plans.

Other Determinants of Financial Status

Housing and Other Saving

Housing equity is the major asset of a large fraction of Americans. Rapid increases in housing values

over the past two decades in particular have motivated consideration of the possible trade-off between housing equity and financial asset saving. And, demographic trends raise questions about the future value of home equity itself.

Daniel L. McFadden finds that future demographic changes in the United States will cause a reduction in the real value of housing.¹⁸ These projected declines in the value of homes that will affect the financial status of future retirees contrast with the large capital gains earned by the current generation of elderly homeowners. The real inflation-adjusted rate of return on housing investments, which has been substantial for past retirees, is projected to become negative in the future. A related study by Hoynes and McFadden concludes that there is very little trade-off between housing equity and financial asset saving.¹⁹ In particular, they conclude that no adjustment in nonhousing assets is made in response to housing price changes, which could have important implications for the welfare of the elderly in the future.

Social Security, SSI, Transfers

Although the financial status of the elderly relative to younger persons has increased substantially in the past two or three decades, some elderly are poor. The limited poverty of the elderly is concentrated among widows. In earlier work, Hurd and I found that many widows who were not poor before the death of a spouse became poor after the death. Much of the reduction in income that places widows below the poverty level is attributable to the reduction in Social Security benefits at the spouse's

death. Thus we²⁰ have explored the effect of changes in Social Security provisions on the financial status of widows. We find that poverty rates of widows could be reduced materially by an increase in survivorship benefits funded by a reduction in the benefits of couples. For example, a 20 percent increase in survivorship benefits would have reduced the 1989 poverty rate of widows from about 39 to about 20 percent. The poverty rate of couples would have increased from 6 to 8 percent under this scenario.

McGarry has considered participation in the Supplemental Security Income Program (SSI).²¹ Using a sample from the Survey of Income and Program Participation, McGarry finds that only 56 percent of those determined to be eligible for SSI are receiving benefits presently, and that participation is determined primarily by the financial situation of the eligible individuals. Although all those eligible for SSI are poor, those with little in the way of other resources are significantly more likely to participate. This finding may be at variance with the widespread beliefs that eligible individuals are discouraged from participation by the difficulty of the application process, or that many are uninformed about the program.

Intergenerational transfers also can play a role not only in the financial status of the elderly, but in the financial status of their aging children as well. The incidence and determinants of intergenerational transfers have been considered in two studies²² by McGarry and Robert Scheoni, using data from the Health and Retirement Survey and the Asset and Health Dynamics Survey. They find that intrafamily transfers from parents to children, and from adult children to elderly

parents, are directed disproportionately to the less-well-off families. These results hold for both the incidence of transfers and for the amounts. For example, within a given year, adult children in the lowest income category were 6 percentage points more likely to receive a financial transfer from their parents. On average they received over \$300 more than siblings in the highest income category.

Aging and Income Inequality

Angus S. Deaton and Christina H. Paxson consider the relationship between the aging of the population and the distribution of income and assets.²³ Because the distribution of income and wealth is more unequal at older than at younger ages, the aging of the population appears to result in a more unequal distribution of income in the population as a whole. In some countries, the distributional consequences of the aging of the population may lead to more individuals at very low income levels than now.

Differential Mortality and Wealth

A series of studies consider the implications of the higher mortality rates of people with fewer financial resources. Two studies have been completed recently on differential mortality and wealth accumulation. One by Orazio Attanasio and Hoynes²⁴ finds that mortality rates among the lowest wealth quartile are about three times as high as mortality among the highest quartile for households at age 65; this disparity increases with age. One implication of this result relates to life-cycle saving patterns. Because wealthier individuals tend to live longer, the average wealth level at

increasing ages overstates the life-cycle wealth pattern at older ages. The implication is that there is substantially more dissaving among the elderly than has been estimated using unadjusted wealth-age profiles.

A related study by Hoynes, Hurd, and Harish Chand²⁵ incorporates differential mortality into estimates of Social Security wealth. Because wealthier individuals live longer, they receive Social Security benefits over a longer period. Thus their estimated Social Security wealth (the discounted value of expected future benefits) is higher, not only because their annual Social Security income is higher, but also because they are likely to receive it for more years. Thus accounting for differential mortality leads to a more unequal distribution of Social Security wealth than is observed assuming average mortality for all recipients. Hoynes, Hurd, and McFadden are pursuing further analysis aimed at determining the explanation for the strong relationship between mortality and financial resources.

The Way We Analyze Saving and Financial Status

Much of the analysis of saving behavior is based on the life-cycle model of saving and consumption, and concentrates on the rate of return as the major determinant of saving. Based on our analysis of the saving effect of IRA and 401(k) plans, Poterba, Venti, and I have argued that traditional explanations of saving leave much of actual saving behavior unexplained. Indeed, many investigators have concluded that data on saving before and after retirement is inconsistent with typical theories of life-cycle saving.

Using cohort data, Deaton and

Paxson find that in many countries it is typical for people to continue to save after retirement.²⁶ This result is contrary to the traditional "life-cycle" explanation of saving, in which people save during their working years to support themselves by drawing down assets after retirement.

Hoynes, Hurd, and McFadden are studying the determinants of saving, with a focus on the effects of subjective information on health, mortality, and other beliefs (obtained in the new Health and Retirement Survey). They are considering how individual subjective beliefs about the future influence saving decisions today. For example, to what extent do people who expect to live longer save more to prepare for a longer life? New data in the Health and Retirement Survey include several innovative measures of subjective beliefs about future longevity and future labor force decisions; these will be used extensively in ongoing work on this project.

How Poverty Is Measured

Much of the evaluation of financial status in the United States is summarized through measures of poverty. Poverty measurement is complicated by the fact that individuals live in households of differing sizes and age compositions. For example, elderly people tend to live in homes with fewer family members than nonelderly individuals, which may mean that they cannot take advantage of household economies of scale to the same extent as younger individuals. Deaton and Paxson²⁷ have explored the sensitivity of poverty counts to variations in assumptions about child costs and economies of scale. Using data from the United States and

six large states in India, they find that poverty counts are very sensitive to the assumptions inherent in the measures that are used.

Medical Care and Cost Increases

Rising U.S. health care costs have been the source of public concern and public debate for some time. The rapid aging of the American population will place increasing pressure on the health care system and its financing. Research in this program is intended to identify the sources of cost increases, to understand the effects of intensive treatments—which may be the central cause of cost growth over the past decade—and to analyze the effects of potential cost containment measures. Much of this work is organized under a project on health care cost containment.

The United States and Other Countries

A comparative study, conducted by Cutler, finds that the cost of health care in the United States rose more rapidly than in other countries with no corresponding increase in relative longevity.²⁸ Part of the rapid growth in U.S. health care costs in recent decades, relative to other OECD countries, results from increases in income. However, after adjusting for differences in income across countries, Cutler finds that the United States still spends substantially more on health care than would be expected. While the income-adjusted growth in U.S. medical expenditures was comparable to that of other countries in the 1960s and 1970s, it grew at a much faster rate than other countries in the 1980s. This relative increase in spending

was not associated with corresponding increases in longevity, however.

Technology and the Source of Cost Increases

Much of the research in this program suggests that cost increases are attributable primarily to the use of more expensive technologies, rather than to the higher cost of performing given procedures. Cutler and McClellan conducted a detailed study of cost increases for the treatment of heart attack patients.²⁹ Between 1984 and 1991, real spending per heart attack patient rose by 4 percent annually. By decomposing the cost and frequency of alternative heart attack treatments over time, they find that essentially all of the expenditure growth resulted from more frequent use of intensive cardiac technologies—catheterization, bypass surgery, and angioplasty. Indeed the prices paid for any given treatment generally declined over this period, while the number of patients treated intensively increased from 10 percent to over 40 percent.

McClellan also has looked at the effect of Medicare's Prospective Payment System (PPS) on treatment decisions and costs. He demonstrates how the current provisions of the PPS system encourage more frequent use of some intensive medical procedures.³⁰ The conventional understanding of PPS is that hospitals are reimbursed a fixed amount per patient, based on the patient's diagnosis, or DRG. This series of studies notes that some DRGs base the amount of reimbursement on the medical treatment provided, rather than on the diagnosis alone. Hospitals perform many more of the intensive treatments that are explicitly reimbursed as DRGs, while intensity and ad-

missions have remained constant or fallen for most diseases that are reimbursed by diagnosis.

Cutler and McClellan also have addressed the determinants of technological change in medical care.³¹ Again, this effort has focused to date on heart attack treatments, but will be extended to a range of other diagnoses. Initial work has considered five factors that may influence the adoption of new technologies at hospitals: the insurance environment in which it is reimbursed; public policy regulating new technology; malpractice concerns; competitive or cooperative interactions among providers; and demographic composition. The initial work suggests that insurance patterns and provider interactions have the largest effect on technology diffusion, at least in the treatment of heart attack patients. More generous insurance is associated with more rapid technology diffusion; when HMO enrollment increases, technology diffusion occurs more slowly. In addition to extending the analysis of technology diffusion to a broader range of health care technologies, an important goal of future work in this area is to evaluate how the availability of technology at hospitals relates to individuals' access to new technologies.

Results that have not yet been fully reconciled with these findings pertain to the patterns of Medicare cost increases. Based on a decomposition of Medicare *hospital* expenditure growth by cohort, gender, race, and percentile in the expenditure distribution, Garber and Thomas E. MaCurdy find a broadly similar rate of increase in Medicare expenditures at all levels.³² The increase in the highest 10 percent of expenditures, for example, has been about the same as the increase for the lowest 50 percent.

However, when differentiating between expenditures, they find much more rapid growth in surgical expenditures. More recent results based on the same methodology suggest more rapid growth in hospital costs among the very highest-cost beneficiaries.

The Effects of Intensive Treatment

Intensive medical treatments are increasingly common, but the effects of these treatments on health care outcomes is not always well understood. McClellan considers the effectiveness of more technologically intensive procedures in the treatment of Medicare patients. He has developed an instrumental variables method that effectively randomizes individual patients to different probabilities of receiving a particular procedure, based on geographical proximity to a hospital that performs those procedures. To date, these methods have been applied most extensively in analyzing heart attack patients,³³ and to the effect of intensive treatment (cardiac catheterization, angioplasty, and bypass surgery) on mortality of patients for whom the benefits of intensive treatment are least conclusive. While intensive treatments are clearly effective in some patients, initial results of this work suggest that the use of invasive cardiac procedures could be reduced by at least one-fourth with no consequences for mortality and over \$300 million per year in savings in hospital costs alone. Similar methods currently are being applied to analyze the effectiveness of alternative treatment of ischemic heart disease, ventricular arrhythmias, and major cancers; and to other long-term outcomes besides mortality (such as the subsequent

development of important medical complications).

Defensive Treatment

Cost increase also may be related to the prevalence of malpractice suits. Daniel Kessler and McClellan have examined the overuse of "defensive" medical practices.³⁴ They consider whether physicians respond to the threat of malpractice lawsuits by being too careful, that is, by administering precautionary treatments with minimal expected benefit because they fear legal liability. They find that malpractice reforms that directly reduce providers' liability lead to reductions of 5 to 9 percent of medical expenditures without substantial effects on medical complications or mortality.

Firm Health Insurance Plans

A comprehensive research effort is focused on the variation in expenditures in firm health insurance plans, and on how differences in plan provisions influence treatment decisions and costs. Early results that McClellan and I reported consider how health care dollars are spent in one large firm.³⁵ This initial work suggests large differences in health care spending that seems to be related to plan provisions. For example, in this firm, substance abuse and mental health disorders account for 40 to 60 percent of total health care costs for younger employees. (In other firms, the cost for substance abuse and mental health is much lower, and expenditures related to other diagnoses are much different.) This initial work also suggests substantial persistence in individual health care expenditures from one year to the next. For example, the most expen-

sive 20 percent of plan enrollees in 1990 accounted for over 85 percent of health care costs in 1990, and still accounted for almost 50 percent of health care costs in 1992.

Matthew Eichner, McClellan, and I explore the implications of individual persistence in expenditures for the feasibility of individual health savings accounts.³⁶ We consider the implications of persistence for a hypothetical health insurance plan composed of a catastrophic health insurance plan established in conjunction with individual health accounts (IHAs). Under this plan, the employer establishes both a high-deductible health insurance plan and an IHA. Employee health care costs below the deductible then are paid out of the IHA; costs above the deductible are paid by the insurance plan. Assets remaining in the account when the employee retires are available for other purposes. Although attractive because it helps to solve the "moral hazard" problem associated with conventional insurance plans, the scheme might be considered infeasible if medical expenditures over a working life are so persistent that certain individuals accumulate little in the IHA while others accumulate a great deal. Although such a plan would produce a range of individual balances at retirement, the results using the illustrative plan design suggest that approximately 80 percent of plan enrollees would retain over 50 percent of their contributions. Only about 5 percent would retain less than 20 percent of their contributions. Thus the authors conclude that persistence in medical expenditures does not present a roadblock to gaining the potential advantages of individual health accounts.

Using data from more than 100 health insurance plans in over 40

firms, with a wide range of plan provisions, ongoing work on this project is evaluating the influence of plan provisions on treatment decisions and costs. Because many employers offer more than one health insurance plan, some of the difference in health care costs across plans can be attributed to self-selection: individuals choosing more generous plans when they expect to have higher health care costs. Some of the difference in cost across plans also can be attributed to more generous plans inducing enrollees to use more health care. Thus a key aspect of our research in this area has been to develop and apply methods that separate out the differences in costs across plans that can be attributed to selection effects from the differences in costs that can be attributed to incentive effects. Eichner is developing methods to isolate the incentive effects of plan provisions on expenditures from the selection effects. Employees who will have large medical expenditures are much more likely than those who will spend little to select plans with higher premiums, lower deductibles, and lower copayments. His initial results, based on instrumental variable techniques, suggest very substantial effects of plan provisions on expenditures, after controlling for selection effects.

More Public and Less Private Insurance

Cutler and Gruber find that publicly provided health insurance tends to "crowd out" private insurance coverage.³⁷ Based on recent expansion in Medicaid eligibility for certain groups during 1987-92, they estimate that about 50 percent of the increase in Medicaid coverage was associated with a reduction

in private insurance coverage. This occurred largely because employees took up employer-based insurance less frequently. While estimated on the basis of specifically targeted Medicaid expansions, the results suggest a substantial trade-off between public and private coverage.

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Research Summaries

Multinational Firms and the Diffusion of Skills and Technology

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Over the past decade we have been engaged in a series of studies

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of the operations of multinational firms (MNCs). These have included examinations of the causes of their existence and growth, their roles in world trade and production, and the effects of their expansion on their home countries and on the economies of the foreign countries in which they produce and sell. In this report, we summarize one part

of this work: studies of the role that MNCs have played in the diffusion of skills and technology to and within the host countries in which they operate.

While MNCs probably account for 20 to 25 percent of the world's total output, most of their production takes place in their home countries. The chief agency for dif-

fusion is their much smaller internationalized output: production outside their home countries. That has risen from about 4.5 percent of world output in 1970 to around 7 percent now, concentrated in what might be described roughly as the industrial sector and hardly represented in the much larger service sector.¹ The studies we describe reflect mostly the consequences from that small fraction of world output.

Theoretical analyses have suggested that host countries are not simply passive recipients of skills and technology that flow automatically from MNCs. Their ability to absorb knowledge and technology can be expected to vary with the extent of their technological and other investment "effort" outside the MNCs' operations.² With Mario Zejan, we find support at the macroeconomic level for the observation that the positive effect on economic growth of inflows of foreign direct investment (FDI) is confined to the upper half of developing countries (by per capita income), presumably those with the local resources needed for absorbing technology from the MNCs.³ In a later extension of that work, we confirm that while there is some bidirectional causality from growth to direct investment as well as from direct investment to growth, the latter influence is predominant.⁴

A study of technology imports by foreign affiliates of U.S. MNCs provides some evidence for the importance of host country policies on the degree of technology transfer. The higher the levels of fixed investment in the country, and the higher the educational level of the labor force, the greater is the extent of technology imports by the U.S. firms' affiliates. On the other hand, the imposition of performance requirements by a host

country, a traditional method of attempting to force technology transfers, seems to produce smaller imports of technology.⁵

The impacts of MNC operations should be stronger at the industry level than at the national level, since they are so concentrated in manufacturing and petroleum. For U.S.-based MNCs in particular, comparative advantage—as revealed in the composition of their worldwide exports—is associated with high intensity of industry R and D, human capital, or skills. These are the ingredients for much of the comparative advantage of the United States as a country, but they play an even more important role for U.S. MNCs that are in a position to be the sources for the diffusion of skills and technology.⁶

While most of the R and D by U.S. MNCs is performed at home, some (and an increasing part) is carried out in affiliates, even those in developing countries. That R and D done overseas is one of the vehicles for technological diffusion and helps to push the host country up the technology scale. With Irving B. Kravis, we find that the higher the R and D intensity of U.S. affiliates in a country, the higher the share of high-tech exports and the lower the proportion of low-tech exports in its total exports. That is the case even after taking account of the host country's per capita income level and its endowment of skilled labor.⁷

A number of empirical studies have shown that MNCs' operations affect the performance of the host country industries in which they operate. In a study of Mexico, for example, Blomström and Edward N. Wolff find that the larger the presence of foreign MNCs in an industry, the faster the rate of productivity convergence toward the

level in the corresponding industry in the United States.⁸

Another detailed study, across Mexican industries, points again to the role of host country economic policies in affecting the rate and extent of technology transfer. In monopolistic industries, foreign firms spend relatively little on the purchase of technology; the more competitive the industry, the greater the import of technology by foreign affiliates.⁹

Studies of effects on wages provide additional evidence for the transfer of skills through direct investment. Within the United States, the higher the share of foreign-owned establishments within an industry in a state, the higher the wage level relative to the national average for that industry and relative to the state average for all industries. The effect is not only on wages in the foreign establishments themselves, but also on domestic establishments in the same locations.¹⁰ There seems to be a similar differential in productivity and a corresponding spillover to domestically owned plants. In contrast, higher participation by foreign-owned firms in production in Mexico and Venezuela results in higher wages and productivity within the foreign plants but no spillover to domestically owned plants.¹¹

One way in which FDI affects host countries is by opening markets for the kinds of exports that would be difficult without the MNC connection. An examination of exports by Asian affiliates of U.S. MNCs finds that they export significantly more to countries to which their parent firms also export than to other countries of similar characteristics. The effect is particularly clear for two relatively high-tech industry groups: electronic components and accessories, and office and computing machinery.¹²

The results from these studies, fragmentary as they are, suggest that despite its relatively small role in aggregate world output, internationalized production has a distinct favorable impact on the growth of host countries. The impact is particularly strong in manufacturing, as might be expected from the concentration of direct investment in that sector, and is reflected in wages, labor productivity, and access to world markets. There is also evidence that host countries need not be passive observers of the process, but can increase their gains by encouraging both competition and local investment in fixed capital and education.

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Seasonal Fluctuations and Business Cycles

Jeffrey A. Miron*

Since the first studies of aggregate economic fluctuations, empirical researchers have struggled over the proper treatment of seasonal fluctuations. Many researchers initially found seasonal fluctuations to be of significant interest,¹ but over time this attitude changed. Beginning during the worldwide contraction of the 1920s and 1930s, researchers came to regard seasonal cycles as a kind of "noise," to be removed from the data before analysis of the underlying business cycle could begin. Arthur F. Burns,

Wesley C. Mitchell, and Frederick R. Macaulay were not only pioneers in business cycle research; they also founded the practice of using seasonally adjusted data to study short-term, aggregate fluctuations.² Their practice, of abstracting from seasonal fluctuations through use of adjusted or annual data, is still generally accepted as the appropriate treatment of seasonal fluctuations.

My research of the last 15 years challenges the conventional practice and returns to the older tradition of examining seasonal fluctuations explicitly and treating them as economically interesting in their own right. Within this general framework, my work has had two main goals. The first is to convince

macroeconomists that seasonal fluctuations are interesting. My research suggests that seasonal cycles are interesting in and of themselves, and that examining seasonal cycles can reveal much about the nature of business cycles.

Second, I explicitly analyze seasonal fluctuations and use them to gain increased understanding of aggregate fluctuations in general. I have completed a number of pieces of research in which the use of seasonal fluctuations provides substantial information about particular economic phenomena, both seasonal and nonseasonal.

My research focuses exclusively on the deterministic, "seasonal dummy" representation of seasonality, rather than on more general

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models. With Joseph J. Beaulieu, I show that the seasonal dummy model provides a good approximation to the behavior of aggregate economic time series. We argue that, under this condition, seasonal fluctuations hold particular interest for the study of aggregate fluctuations.³ That is because identifying assumptions about fluctuations in the seasonal dummy—such as the assumption that Christmas shopping represents a shift in demand—are often more plausible than analogous assumptions about other kinds of seasonal fluctuations, or about conventional business cycle fluctuations.⁴ These identifying restrictions can be used both to show that seasonal fluctuations themselves provide compelling examples of various macroeconomic phenomena and to analyze the behavior of business cycle fluctuations in general.

As a first step in this task, Robert B. Barsky, Beaulieu, and I demonstrate that seasonal fluctuations in aggregate variables are quantitatively important. We document the seasonal patterns in these variables for the United States and other countries.⁵ Examination of these patterns indicates that seasonal fluctuations provide examples of a number of interesting macroeconomic phenomena, including shifts in preferences (Christmas), production bunching (summer vacation periods), and endogenous monetary policy (seasonal interest rate smoothing). The patterns also suggest a number of identifying restrictions about seasonal fluctuations that can be used to test particular economic hypotheses.

In the next step of this research program, Barsky, Beaulieu, and I compare seasonal cycles to business cycles by asking whether seasonal cycles display the key “styl-

ized facts” of the business cycle. Perhaps surprisingly, we find that seasonal fluctuations in aggregate variables display the critical cross-correlations that characterize business cycle fluctuations, in most cases even more dramatically than the business cycle itself. In particular, over the seasonal as well as the business cycle, output movements are correlated strongly across sectors; production and sales covary closely; output fluctuations are highly elastic with respect to fluctuations in labor input; and real output is strongly correlated with nominal money. This similarity between seasonal cycles and business cycles suggests that both are generated by similar economic propagation mechanisms.

My work with Beaulieu and Jeffrey K. MacKie-Mason provides further evidence for the similarity between seasonal and business cycle propagation mechanisms: we examine the correlation across industries and countries in the amounts of seasonal and business cycle variation.⁶ We find that these amounts are correlated strongly and consistently positively, both across countries and industries. We argue that the most natural explanation for this finding is that a similar economic propagation mechanism is at work in producing both seasonal and business cycles. We offer a particular example of such a mechanism, based on the endogenous choice of capacity constraints. Steven G. Cecchetti, Anil K. Kashyap, and David W. Wilcox provide related evidence of interactions between seasonal and business cycle fluctuations, and they use this evidence to shed light on the nature of the business cycle propagation mechanism.⁷

Stephen P. Zeldes and I also use seasonal fluctuations to examine

the production-smoothing model of inventories.⁸ Much research on the empirical behavior of inventories examines some variant of the production-smoothing model, but most of this work uses seasonally adjusted data and omits analysis of seasonal fluctuations. This approach is problematic, however, since seasonal fluctuations account for a major portion of the variation in production, shipments, and inventories. Further, seasonal fluctuations are anticipated, and adjusted data are likely to reject the production-smoothing model even when it is correct because they violate a key orthogonality condition.

Zeldes and I posit a production-smoothing model that explicitly accounts for the seasonal fluctuations in production and sales, and test this model using seasonally unadjusted data. Our key finding is that the seasonal patterns in production and sales are virtually identical, a fact that holds far more broadly than for the particular industries and series that we consider.⁹ Our model can explain this similarity only if the seasonal pattern in sales is virtually identical to that in the technology. Since this condition is unlikely to hold, the model is not easily reconciled with the data.

In a different application, I examine the relationship between seasonal fluctuations and the founding of the Federal Reserve.¹⁰ After the founding of the Fed in 1914, both the frequency of financial panics and the size of the seasonal movements in nominal interest rates declined substantially. Since the Fed was established in part to “furnish an elastic currency,” it is natural to hypothesize that the Fed caused these changes in the behavior of financial markets. However, a number of other major changes in the economy and in the

financial system occurred during this period, including World War I, the shift from agriculture to manufacturing, and the loosening of the gold standard. Nevertheless, my research suggests that the Fed caused the decrease in the frequency of panics by pursuing the open market policy that reduced seasonality in nominal interest rates.

This conclusion has not gone unchallenged, however: Truman Clark notes that the disappearance of seasonal fluctuations in nominal interest rates was a worldwide phenomenon.¹¹ Although by 1914 the United States was certainly not a small country, neither was it so dominant that it should have been able, acting on its own, to alter greatly the random processes of world prices and interest rates. Clark instead attributes the altered behavior of nominal interest rates to the dissolution of the worldwide gold standard at the start of World War I.

Robert B. Barsky, N. Gregory Mankiw, David A. Weil, and I respond to Clark's critique by evaluating the role of the destruction of the gold standard and the founding of the Federal Reserve, both of which occurred in 1914, in contributing to the changes in the behavior of interest rates and prices after 1914.¹² We present a model of policy coordination in which the introduction of the Fed stabilizes interest rates, even if the gold standard remains intact, and we offer empirical evidence that the dismantling of the gold standard did not play a crucial role in precipitating the changes in interest rate behavior.

Having argued that the elimination of seasonal fluctuations was a primary motivation for establishment of the Fed, Mankiw and I examine the desirability of this policy, which continues through the pres-

ent day.¹³ Although the Fed policy of accommodating seasonal fluctuations in asset markets continued after the Depression, the relative absence of financial panics since that period probably reflects other factors, particularly the introduction of deposit insurance in 1934. In addition, the elimination of financial panics need not be the only effect of accommodating interest rate seasonals, even if this was the original motivation for the policy. Seasonal fluctuations in output and employment are at least as large as business cycle fluctuations, so it is interesting to analyze the more general effects of smoothing nominal interest rates over the seasons. My analysis with Mankiw suggests that the welfare implications of smoothing seasonal fluctuations in interest rates are probably modest.

Still, the welfare implications of seasonal cycles are far from settled.¹⁴ They may have no interesting welfare consequences, and therefore may not be associated with interesting policy issues: this is the case in seasonal real business cycle models, since all fluctuations are efficient responses to changes in preferences and technology.¹⁵ But seasonal fluctuations may be examples of endogenous cycles, as Robert E. Hall has emphasized,¹⁶ or they may occur in economies with preexisting distortions. In either case, there is no presumption that the laissez-faire amount of seasonality is optimal. Moreover, many existing policies affect the equilibrium magnitude and timing of seasonal fluctuations (such as legal holidays, seasonal interest rate smoothing, imperfectly experience-rated unemployment insurance).¹⁷ Thus, seasonal fluctuations *do* raise welfare and policy questions per se, even if they are unrelated to business cycle fluctua-

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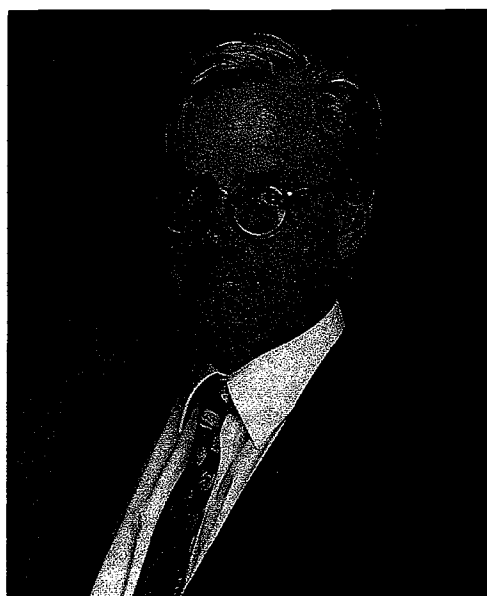
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¹⁷On the seasonal effects of unemployment insurance; see D. Card and P. B. Levine, "Unemployment Insurance Taxes and the Cyclical and Seasonal Properties of Unemployment," *Journal of Public Economics* 53, 1 (February 1994).



NBER Profile: Magnus Blömstrom

Magnus Blömstrom, a research associate in the NBER's Program on International Trade and Investment and a professor at the Stockholm School of Economics, has been associated with the NBER since 1985. He received both his B.A. and his Ph.D. in economics from the University of Gothenburg.

Blömstrom was an assistant professor of economics at the University of Gothenburg from 1985–7. He became an associate professor at the Stockholm School of Economics in 1987, and was promoted to full professor in 1990.

Blömstrom also has held visiting positions in Bangkok, Mexico City, Nairobi, New York, Santiago, and Singapore. He has served as a consultant to a number of organizations, and his written work has been published in numerous journals and volumes. His latest book on multinationals and their home countries, coauthored by Robert E. Lipsey, is forthcoming from the University of Chicago Press.

Blömstrom and his wife Christina live in Stockholm with their two children: Konrad (5) and Ulrika (2).

NBER Profile: *Robert E. Lipsey*

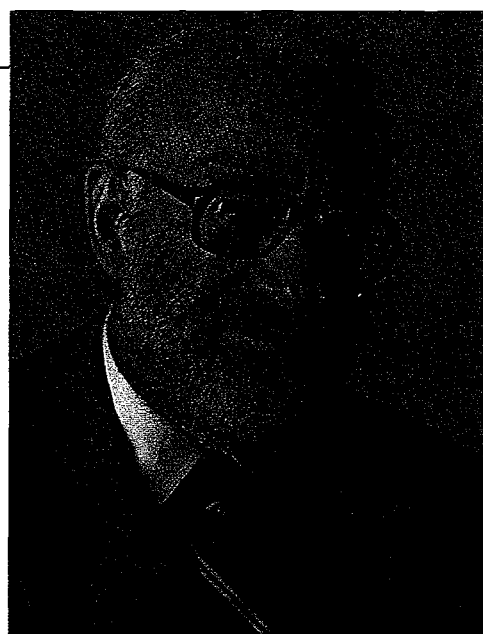
Robert E. Lipsey is an NBER research associate in three programs: international trade and investment, international finance and macroeconomics, and productivity. He is also a professor emeritus of Queens College and the Graduate Center of the City University of New York (CUNY). He began his association with the NBER in 1945 when he was an 18-year-old graduate student at Columbia, working at first with Geoffrey H. Moore and Solomon Fabricant. He became a member of the Bureau's senior research staff in 1960, then vice president-research, director of international studies, and finally director of the New York office in 1978.

His research has included studies of price measurement, national balance sheet accounts, the role of price changes in international trade, international comparisons of prices and output, the measurement of saving and investment, the history of U.S. trade, and the activities of multinational firms. Over the years he has enjoyed long collabora-

tions with Raymond W. Goldsmith, Irving B. Kravis, and Magnus Blömström. Lipsey also has been an active member of the NBER's Conference on Research in Income and Wealth for many years, has served on its executive committee, and has been a coorganizer of three of its conferences.

Before beginning full-time teaching at CUNY, Lipsey was a lecturer in economics at Columbia from 1961 to 1964. He has served as a consultant to a number of government agencies and international agencies, and is currently on the executive committee of the European Union Studies Center at CUNY. Lipsey is also a fellow of the American Statistical Association, a member of the Board of Directors of the Western Economic Association, and president-elect of the International Trade and Finance Association, and has served on the editorial boards of the *Review of Economics and Statistics* and the *Review of Income and Wealth*.

Lipsey and his wife, Sally, a pro-



fessor of mathematics at Brooklyn College of CUNY before her retirement, have three daughters and eight grandchildren. When not chasing grandchildren, Lipsey raises small quantities of vegetables and large quantities of weeds in Putnam Valley, works toward reaching the 60-minute mile in swimming, and practices the piano in the hope of recovering the level of his teenage days at the Juilliard School.

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"Multinational Corporations and Spillovers," by **Magnus Blomström** and **Ari Kokko**.

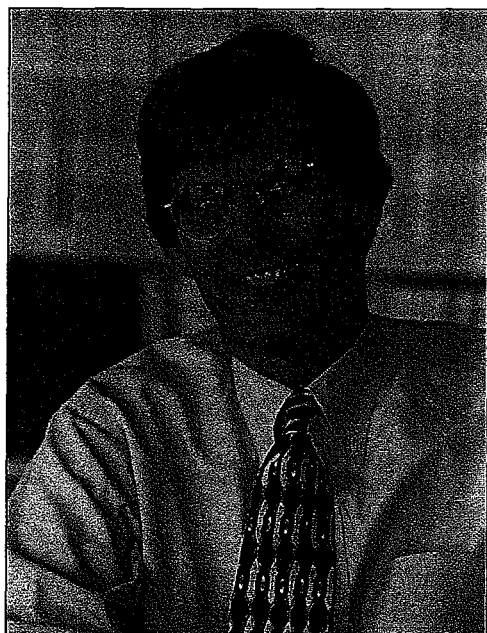
"Brazilian Industrialization Under Vargas: Structural Breaks and Continuities," by **Hassan Arvin-Rad**,

Maria J. Willumsen, and **Ann Dryden Witte**.

"How Severe Is Global Retaliation Risk Under Increasing Regionalism?" by **Carlo Perroni** and **John Whalley**.

"The World Over the Next Twenty-Five Years: Global Trade Liberalization, and the Relative Growth of Different Regions," by **Jeffrey A. Frankel**.

"Recent Exchange Rate Experience and Proposals for Reform," by **Jeffrey A. Frankel**.



NBER Profile: *Jeffrey A. Miron*

Jeffrey A. Miron is chairman of the Economics Department and professor of economics at Boston University, and a research associate of the National Bureau of Economic Research. He received his B.A. in economics from Swarthmore College in 1979, and his Ph.D. in economics from MIT in 1984. From 1984 to 1990, he served on the faculty of the University of Michigan. In 1989-90, he was also a visiting faculty member at MIT's Sloan School of Management.

In 1988, Miron was awarded an Olin Fellowship from the NBER, and in 1989 he received a Sloan Foundation Research Fellowship.

His research has been published extensively in professional journals; he has written on numerous topics, including the theory and practice of monetary policy, the quality of government statistics, the seasonal fluctuations in aggregate activity, the seasonality of births, and the economic history of drug prohibition. He also has served as consultant to the Federal Reserve Board on several occasions.

Miron's wife Patty is a cytogeneticist. They have two children: Laura, 4; and Daniel, 2. "If I had any spare time," he writes, "I would cook, jog, and play tennis."

NBER Profile: *David B. Yoffie*

David B. Yoffie, the Max and Doris Starr Professor of International Business Administration at Harvard Business School, represents Harvard on the NBER's Board of Directors. He was elected to the board in 1995.

Yoffie holds a B.A. in politics from Brandeis University and a Ph.D. in international political economy from Stanford University. He has taught at Harvard Business School since 1981, and was named Starr Professor in 1993. This academic year, he has been a visiting

scholar at Stanford's Graduate School of Business.

Yoffie is a director of several companies, including Intel Corporation. He also serves as a reviewer for a number of academic journals, and has written or edited six books: most recently, *Competing in the Age of Digital Convergence* (Harvard Business School Press, forthcoming 1996).

Yoffie lives in Newton, MA with his wife and two young daughters. When he is not traveling to exotic locations, he enjoys skiing, running, playing squash, and photography.



Conferences

Determination of Exchange Rates

Over 60 academic economists gathered in Cambridge on May 10-11 for the NBER-Universities Research Conference on "Determining Exchange Rates." Robert J. Hodrick, NBER and Northwestern University, organized this program.

Torben G. Andersen, Northwestern University, and **Tim Bollerslev**, NBER and University of Virginia, "DM-Dollar Volatility: Intraday Activity Patterns, Macroeconomic Announcements, and Longer-Run Dependencies"

Discussant:
Richard K. Lyons, NBER and University of California, Berkeley
Stephen F. Gray, Duke University, and **Geert Bekaert**, NBER and Stanford University, "Target Zones and Exchange Rates: An Empirical Investigation"

Discussant:
Michael W. Klein, NBER and Tufts University
Alan M. Taylor, NBER and Northwestern University, "International Capital Mobility in History: Purchasing Power

Parity in the Long Run"

Discussant:
Michael M. Knetter, NBER and Dartmouth College

Raman Uppal, University of British Columbia; **Prakash Apte**, Indian Institute of Management (Bangalore); and **Piet Sercu**, Katholieke Universiteit Leuven (Belgium), "The Equilibrium Approach to Exchange Rates: Theory and Tests"

Discussant:
Kenneth A. Froot, NBER and Harvard University
Fernando Alvarez, University of Pennsylvania, and **Andrew Atkeson**, NBER and University of Pennsylvania, "Liquidity, Inflation, Interest Rates, and Exchange Rates"

Discussant:
David Backus, NBER and New York University
V. V. Chari, University of Minnesota; **Patrick Kehoe**, NBER and University of Pennsylvania; and **Ellen R. McGrattan**, Federal Reserve Bank of Minneapolis, "Monetary Shocks and Real

Exchange Rates in Sticky Price Models of International Business Cycles"

Discussant:
Alan C. Stockman, NBER and University of Rochester
Ilan Goldfajn, Brandeis University, and **Rodrigo O. Valdés**, MIT, "The Aftermath of Appreciations"

Discussant:
Nancy P. Marion, Dartmouth College
Andrew M. Warner, Harvard University, "Nominal Exchange Rate Equilibria in the Nontraded Model: Mexico 1994"

Discussant:
Richard C. Marston, NBER and University of Pennsylvania
Menzi Chinn, University of California, Santa Cruz, and **Louis Johnston**, Gustavus Adolphus College, "Real Exchange Rate Levels, Productivity, and Demand Shocks: Evidence from a Panel of 14 Countries"

Discussant:
Robert E. Cumby, NBER and Georgetown University

Andersen and **Bollerslev** characterize the volatility process of the DM-dollar foreign exchange market by investigating one full year of five-minute returns extracted from quotes obtained from the Reuters interbank network. Their simple model captures the significant intraday activity patterns, the strong announcement effects associated with the regularly scheduled re-

lease of macroeconomic statistics, and the persistent interdaily volatility processes that are familiar from studies of foreign exchange returns at the daily or lower frequencies.

Gray and **Bekaert** find evidence of two types of jumps in exchange rates. *Realignment jumps* are associated with the periodic realignments of the target zone; *within-the-band jumps* can be accommo-

dated within the current target zone. The exchange rate may jump outside the current target zone band, in the case of a realignment; when no jump occurs, the target zone is credible (there is zero probability of a realignment), and the exchange rate must stay within the band. The authors conclude that the French franc/D-mark rate exhibits considerable nonlinearities;

realignments are predictable; and the credibility of the system did not increase after 1987. Moreover, their model implies that the foreign exchange risk premium becomes large during speculative crises. A comparison with the D-mark/U.S. dollar rate suggests that an explicit target zone does have a noticeable effect on the time-series behavior of exchange rates.

For a sample of 20 countries, **Taylor** investigates one widely used criterion for capital market integration, purchasing power parity (PPP), and its evolution since the late nineteenth century. The evidence for PPP is mixed: the strongest form of PPP, entailing stationarity of the real exchange rate, is not supported broadly. However, weaker forms of PPP can be supported, with evidence of cointegration between different countries' common-currency price levels. The interwar period, particularly the Great Depression, represented the nadir of international market integration in the modern era.

Uppal, Apte, and Sercu characterize the equilibrium exchange rate in a general equilibrium economy without imposing strong restrictions on the output processes, preferences, or commodity market imperfections. The nominal exchange rate is determined by differences in initial wealths—the currencies of richer countries tend to be overvalued by PPP standards—and by differences in marginal indirect utilities of total nominal spending. Changes in the exchange rate mirror differences in growth rates of real spending weighted by relative risk aversion (which can be time-varying and can differ across countries) and differences in inflation rates computed from marginal spending weights. When nominal spending is given an independent

role (next to prices) in the short-term dynamics, both PPP and the constant relative risk-aversion model become acceptable.

Alvarez and Atkeson present a model of inflation and nominal asset prices in which liquidity effects that arise from limitations of the transactions technology play an important role in determining nominal asset prices. They compare the predictions of this model to data on U.S. inflation, short-term nominal and ex post realized real interest rates, nominal and real exchange rates of the United States versus the other G7 countries, and the behavior of excess foreign exchange returns. They find that the model's predictions match certain features of the data surprisingly well.

Chari, Kehoe, and McGrattan develop a quantitative general equilibrium model with monetary shocks, sticky prices, price discrimination, incomplete asset markets, and staggered price setting. In their data, fluctuations in the real exchange rate are large and persistent. They find that monetary shocks account for about one-third of the variability, and do not lead to persistent fluctuations.

Goldfajn and Valdés study the characteristics of real exchange rate appreciations. They find a large asymmetry between the duration of the appreciation buildup and the return-to-normality phases. They show that fixed arrangements are more likely to suffer appreciations, and that appreciation episodes occur more often during the last part of their sample period (1980–94). Episodes also are notably shorter when fundamentals are considered. Their overall conclusion is that it is very unlikely that we can undo large and medium appreciations without nominal devaluations.

When can a nominal exchange rate be said to be overvalued, or undervalued? **Warner** attempts to make the case that an approach based explicitly on the traded–nontraded model offers a constructive way to answer this question. He uses data from Mexico's recent exchange rate crisis to illustrate and test this approach. The results suggest that the peso was about 25 percent overvalued on the eve of Mexico's exchange rate crisis in December 1994.

Chinn and Johnston investigate the long-run relationships among the real exchange rate, total factor productivity levels in the traded and nontraded sector, and government spending for 14 OECD countries. The most important determinants of the real dollar exchange rate include traded sector productivity, U.S. government spending, and real oil prices. Using the model augmented by oil prices, they find that in 1991 (the last year that productivity data are available) there is less dollar overvaluation than is implied by a naive version of PPP.



Interjurisdictional Differences in Tax and Expenditure Policies

The NBER's Transatlantic Public Economics Seminar (TAPES) devoted this year's meeting on May 29-31 in Amsterdam to the subject of "Interjurisdictional Differences in Tax and Expenditure Policies." Roger H. Gordon, NBER and University of Michigan, and A. Lans Bovenberg, Tilburg University, organized this program:

Harry Grubert, U.S. Department of the Treasury, and
John Mutti, Grinnell College, "Do Taxes Influence Where U.S. Corporations Invest?"

Discussants:

Mary E. Lovely, Syracuse University, and

Michael Devereux, Institute for Fiscal Studies (United Kingdom)

Michael Devereux and
Rachel Griffith, Institute for Fiscal Studies, "Taxes and Foreign Direct Investment: Evidence from a Panel of U.S. Multinationals"

Discussants:

Harry Grubert, and

Garry Young, National Institute of Economic and Social Research (United Kingdom)

Garry Young, "The Influence of International Taxation on Domestic Fixed Investment: A Cross-Country Study"

Discussants:

Martin Feldstein, NBER and Harvard University, and

Agnar Sandmo, Norwegian School of Economics and Business Administration

Kristen Willard, Columbia University, "On the Survival of

Capital Income Taxes"

Discussants:

Roger H. Gordon, and
Søren Bo Nielsen, Copenhagen Business School

Sylvester Eijffinger,
Harry Huizinga, and
Jan Lemmen, Tilburg University, "Interest Withholding Taxes and the Government Debt Market"

Discussants:

Therese McGuire, MIT, and
Kristen Willard

Martin Feldstein, and
Marian Vaillant Wrobel, Abt Associates, "Can State Taxes Redistribute Income?" (NBER Working Paper No. 4785)

Discussants:

Nils Sören Blomquist, Uppsala University; and

Pierre Pestiau, University of Liège

Robin W. Boadway and
Marianne Vigneault, Queen's University (Canada), and
Maurice G. Marchand, Center for Operations Research and Econometrics (Belgium), "The Consequences of Overlapping Tax Bases for Redistribution in a Federation"

Discussants:

James M. Poterba, NBER and MIT, and

Hilary W. Hoynes, NBER and University of California, Berkeley

Theresa Garcia-Milà, Universitat Pompeu Fabra, and

Therese McGuire, "Interregional Transfers and the Response of Labor and Capital"

Discussants:

Harry Huizinga, and

Robert A. Moffitt, NBER and Johns Hopkins University

Robert A. Moffitt, and
David C. Ribar and
Mark V. Wilhelm, Pennsylvania State University, "State Welfare Policy in the United States: The Role of the Labor Market"

Discussants:

Anthony Atkinson, Oxford University, and

Caroline Minter Hoxby, NBER and Harvard University

Helmuth Cremer, University of Liège, and

Pierre Pestiau, "Social Insurance and Labor Mobility in an Economic Union"

Discussants:

Harold Uhlig, University of Tilburg, and

Jonathan Gruber, NBER and MIT

Mary E. Lovely and
John M. Yinger, Syracuse University, "State Differences in the Return to Human Capital: Can Educational Subsidies Help States Exploit Agglomeration Economies?"

Discussants:

A. Lans Bovenberg and
Maurice G. Marchand

Caroline Minter Hoxby, "Is There an Equity-Efficiency Trade-Off in School Finance? Tiebout and a Theory of the Local Public Goods Producer" (NBER Working Paper No. 5265)

Discussants:

Dennis Epple, Carnegie-Mellon University, and

Frederick van der Ploeg, University of Amsterdam

Grubert and Mutti examine the amount of capital invested by more than 500 U.S. multinational corporations in 60 potential locations to identify the role of host country effective tax rates. They find that effective tax rates have a significant effect on both the probability that a location will be chosen and on the amount of capital invested there. A local tax rate that is 1 percentage point lower appears to be associated with about 3 percent more real capital invested.

Devereux and Griffith consider the factors that influence the location decisions of multinational firms. They find that the average tax rate plays a role in the choice among locations, but a much less significant role in the choice of whether to locate production in Europe or choose an outside option (exporting, or not serving the foreign market at all). A 1 percentage point increase in the effective average tax rate reduces the probability of the firm locating in that country by around 3.5 percent, they conclude.

Young empirically investigates the relationship between international corporate taxation and domestic fixed investment in a number of OECD countries. He argues that corporate taxation affects fixed investment in a particular country through two separate channels: an effective tax rate, which works through the effects of taxes on the user cost of capital; and a measure of the international competitiveness of the domestic tax system, which operates through the effect of taxes on the attractiveness of that country as a location for production.

A growing strand of the international tax literature contends that, where capital is perfectly mobile and perfectly substitutable across national borders, and when individuals can evade domestic taxes

on foreign source income, taxes on capital income will be driven to zero by international competition for revenue from a mobile tax base. **Willard** examines whether the details of existing international tax institutions are consistent with Gordon's (1992) adaptation of the tax competition model. In particular, she exploits the cross-sectional variation in international withholding rates specified by national legislation and bilateral treaties. However, her findings do not support the hypotheses drawn from models of international tax competition.

Eijffinger, Huizinga, and Lemmen examine to what extent withholding taxes on nonresident interest explain deviations from covered interest parity in the international 3-month Treasury bill market and deviations from closed interest parity in the international 5-year government bond market. They find that U.S. dollar yields on national Treasury bills and pretax yields on 5-year government bonds fully reflect nonresident interest withholding taxes imposed on American or Japanese investors.

Feldstein and Vaillant Wrobel conclude that state and local governments cannot redistribute income. Since individuals can avoid unfavorable taxes by migrating to jurisdictions with more favorable tax conditions, a relatively unfavorable tax will cause gross wages to adjust until the resulting net wage is equal to what is available elsewhere. They show that gross wages adjust rapidly to the changing tax environment. Thus, states cannot redistribute income even for a period of a few years.

Boadway, Vigneault, and Marchand study equilibrium tax and expenditure policies in a federation consisting of a federal government and several state governments.

Each state has the same total population and mix of ability-types. If expenditure responsibilities are divided so that the states spend on a public good while the federal government spends on redistributive transfers, one source of fiscal externality is eliminated, but the combined tax rate will be excessive. The socially optimal outcome can no longer be attained by the federal government behaving strategically.

The 17 regional governments of Spain receive grants from both the central government and the European Union. The grants are generally redistributive and are intended to stimulate economic activity in the poorer regions. **Garcia-Milà and McGuire** evaluate the effectiveness of the grants by comparing the economic fortunes of richer regions to those of poorer regions before the implementation of the grant programs versus in the most recent period. They find that these grant programs have not been effective in improving the economic performance of the poorer regions.

Moffitt, Ribar, and Wilhelm posit that voters prefer welfare benefits that are tied to low-skilled wages. Using a 1969-92 panel of state-level data, General Social Survey data on voter preferences for welfare, and data from the Current Population Survey, they determine the voter in each state who has the median preferred welfare benefit level.

Cremer and Pestieau present a political economy approach to payroll tax competition between countries that adopt different systems of social insurance. They consider three such systems: the Bismarckian one, in which benefits are linked partially to payroll taxes; the Beveridgean one, in which benefits are flat; and the private market one, which relies on the concept of actuarial fairness.

Lovely and Yinger investigate the ability of educational subsidies to raise wages in a small, open economy. An educational subsidy increases the amount of human capital acquired, thereby raising the return to schooling. Using measures of manufacturing diversity in U.S. states, along with data on individual wages, the authors find that the return to human capital is high-

er in states with greater manufacturing diversity.

Hoxby reasons that when households are better able to choose among school districts, their comparisons give them more information about how their own school district is doing. Armed with this better information, local referendums and budget votes are much more powerful tools for

making schools care about both quality of education and cost. Using data on the degree of competition that school districts face, Hoxby finds that school districts that face more competition have lower costs and better quality of education for a given cost.

Selected papers from this conference will appear in a future issue of the *Journal of Public Economics*.

East Asian Seminar on Economics

The NBER, Hong Kong University of Science and Technology, Chung-Hua Institution for Economic Research (CHIER), Korea Development Institute (KDI), National University of Singapore, and the Tokyo Center for Economic Research jointly sponsored the seventh annual East Asian Seminar on Economics in Hong Kong on June 19-22. This year's theme was "Changes in Exchange Rates in Rapidly Developing Countries: Theory, Practice, and Policy Issues." Anne O. Krueger, NBER and Stanford University, and Takatoshi Ito, NBER and International Monetary Fund (IMF), organized this program:

Sebastian Edwards, NBER and University of California, Los Angeles, "The Determinants of the Choice Between Fixed or Flexible Exchange Rate Regimes"

Discussants:

Anne O. Krueger, and
Andrew K. Rose, NBER and University of California, Berkeley

Takatoshi Ito, and

Peter Isard and

Steven Symansky, IMF,

"Economic Growth and the Real Exchange Rate: An Overview of the Balassa-Samuelson

Hypothesis in Asia"

Discussants:

Kenichi Ohno, University of Tsukuba, and
Anne O. Krueger

Assaf Razin, NBER and IMF, and
Gian Maria Milesi-Ferretti, IMF, "Current Account Deficits and Capital Flows in East Asia and Latin America: Are the Nineties Different from the Early Eighties?"

Discussants:

Koichi Hamada, Yale University, and
Andrew K. Rose

Tetsuji Okazaki, University of Tokyo, "Foreign Exchange Allotment Policy in Postwar Japan: Its Role and Institutional Framework"

Discussants:

Ronald McKinnon, Stanford University, and
Shinji Takagi, Osaka University

Shinji Takagi, "The Yen and Its Asian Neighbors: Cooperation or Competition?"

Discussants:

Tetsuji Okazaki, and
K. C. Fung, University of Hong Kong

Ronald McKinnon and

Kenichi Ohno, "The Syndrome of the Ever-Higher Yen: The United States, Japan, and Other

East Asia"

Discussants:

Kazuo Ueda, University of Tokyo, and
Sang-Woo Nam, KDI

Stanley Black, University of North Carolina, "Issues in Korean Exchange Rate Policy"

Discussants:

Chong-Hyun Nam, Korea University, and
Baekin Cha, City University of Hong Kong

Sang-Woo Nam, "Evaluation of Korea's Exchange Rate Policy"

Discussants:

Stanley Black, and
Leonard Cheng, Hong Kong University of Science and Technology

Dong-Chul Cho and

Young-Sun Koh, KDI,

"Liberalization of Capital Flows: Big-Bang or Gradualism"

Discussants:

Chong-Hyun Nam and
Koichi Hamada

Kenneth Lin, National Taiwan University, "Nontraded Goods, Consumption Growth, and the Real Exchange Rate: A Cointegration-Euler Equation Approach"

Continued on page 24

Discussants:

Yun-Wing Sung, The Chinese University of Hong Kong, and Hsiu-Ling Wu, CHIER

Kuo-Liang Wang, National Cheng-Chi University, and **Chung-Shu Wu**, The Institute of Economics, Academia Sinica, "Exchange Rate Pass-Through and Industry Characteristics: The Case of Taiwan's Exports of Midstream Petrochemical Products"

Discussants:

Kenichi Ohno, and Y. C. Jao, University of Hong Kong
Hsiu-Ling Wu, CHIER, "Testing for the Fundamental Determinants of the Long-Run Real Exchange Rate"

Discussants:

Chi-Wa Yuen, University of Hong Kong, and Sang-Woo Nam

Yum-Keung Kwan and **Francis Lui**, Hong Kong University of Science and Technology, "Hong Kong's Currency Board and Changing Monetary Regimes"

Discussants:

Barry Eichengreen, NBER and University of California, Berkeley, and Zhang Zhaoyong, National University of Singapore
Zhang Zhaoyong, "Exchange Value of the Renminbi and China's Balance of Trade: An Empirical Study"

Discussants:

Larry Qiu, Hong Kong University of Science and Technology, and Kuo-Liang Wang

Barry Eichengreen and **Andrew K. Rose**, "Contagious Currency Crises: Channels of Transmission"

Discussants:

Takatoshi Ito and Sebastian Edwards
Jeffrey D. Sachs, NBER and Harvard University, "Exchange Rate Regimes and Financial Crises: A Comparison of Latin America and East Asia"

Discussants:

Kazuo Ueda and Sebastian Edwards

Edwards develops a simple theoretical framework based on a loss function, which depends on the monetary authorities' preferred trade-off between inflation and unemployment targets. He initially applies the framework to the simple case in which monetary authorities must choose between a (permanently) fixed and a flexible exchange rate regime. This framework subsequently is extended to cover the somewhat more complicated case in which the authorities must choose between fixed-but-adjustable and flexible exchange rate regimes. Using an unbalanced panel dataset of 63 countries from 1980–92, Edwards finds that the most important explanatory variables are measures of countries' historical degree of political instability; measures of the probability of abandoning pegged rates; and the relative importance of real (unemployment) targets in the preferences of monetary authorities.

Ito, Isard, and Symansky test the Balassa–Samuelson hypothesis: that rapid economic growth is accompanied by real exchange rate appreciation because of differential productivity growth between tradable and nontradable sectors. Using data for the APEC economies from 1973–92, they find that Japan, Korea, and Taiwan do follow the Balassa–Samuelson path. These countries had similar patterns of industrialization, all increasing their share of high value-added exports as they grew. Although Hong Kong and Singapore grew fast, their real exchange rates appreciated only moderately, perhaps because of high productivity growth in their service sectors. Other fast-growing ASEAN countries, including Thailand, Indonesia, and Malaysia, did not experience real exchange rate appreciation.

Razin and Milesi-Ferretti analyze the sustainability of protracted current account deficits. They com-

pare the experience with protracted external imbalances in three East Asian countries and three Latin American countries during the late 1970s/early 1980s and the 1990s. They discuss the different macroeconomic factors at play in the two periods, both at the domestic and international levels. They also consider developments in the capital market, and draw on their theoretical analysis and the country experiences to examine potential indicators of current account sustainability.

Okazaki describes the institutional framework of the foreign exchange allotment system in 1950s Japan, and analyzes its function with data on firm-level foreign exchange allotments. The foreign exchange allotment system generates a substantial amount of rents, which may lead to serious rent-seeking activities. To limit this, the MITI established clear and objective criteria for allotting foreign ex-

change to each firm, and committed to these criteria by announcing them publicly. In many cases, the criteria were based on the export performance and production capacity of each firm, and this played a role in promoting export and investment.

Typically, when the nominal value of an East Asian currency is regressed on a set of partner currencies, the estimated weight of the Japanese yen is relatively small. However, looking alternatively at how the particular currency moves when the yen fluctuates sharply against the U.S. dollar, **Takagi** finds that the weight is considerably larger. Moreover, in the case of the Korean won and the Malaysian ringgit there is some evidence that the weight is even larger when the yen depreciates against the dollar. This suggests that the yen may be perceived as the currency of a competitor country.

According to **McKinnon** and **Ohno**, the yen continually appreciated against the U.S. dollar after 1971 because the Japanese and American governments were caught in a mutual policy trap. Continual threats of a trade war by the United States induced the yen to ratchet up episodically in 1971-3, 1977-8, 1985-7, and early to mid-1995. These great yen appreciations ameliorated commercial tension, although the trade gap widened. The Bank of Japan validated this syndrome by following a deflationary monetary policy relative to what had been established independently by the U.S. Federal Reserve system. After 1985, the result was great macroeconomic instability in Japan, including two high-yen recessions.

In recent years, fluctuations in the yen/dollar rate, competition from other East Asian competitor nations, and financial liberalization

have raised concern among policy-makers about the appropriate exchange rate policy for Korea. **Black** discusses the main exchange rate policy issues for Korea, including the choice of either an external or internal target for monetary policy, depending on the need for flexibility in dealing with external shocks versus credibility in establishing domestic price stability; the choice of an external comparison basket; the effects of financial liberalization; the issue of a regional currency area; and the long-run trend of the real exchange rate.

Nam describes Korea's exchange rate regimes since the 1970s, and analyzes the pattern of exchange rate movements and management. He also assesses the long-run behavior of the won. Finally, he discusses policy issues, including the overconcern about current account deficits, the choice of exchange rate regimes, the need to pay more attention to the movement of the yen, and the feasibility and desirability of joint floating for East Asian NICs.

Cho and **Koh** attempt to provide quantitative assessments of several macro policies associated with the liberalization of Korean capital markets. Accommodative monetary policies to attain exchange rate stability appear either unsustainable or undesirable for macro stability. The big-bang approach, with exchange rate overshooting, generates an initial recession in the short run. A gradual opening of capital markets in conjunction with exchange rate adjustment appears desirable for macro stability.

Lin examines from the demand side the movement of the real exchange rate. He proposes theoretical models with three goods—exportables, importables, and non-

tradables—and gives several reasons why purchasing power parity may not hold. One particularly interesting hypothesis is that the currency of the country with the faster consumption growth will experience the real appreciation. Using the tradables and nontradables model in the context of time-series data, Lin then tests for cointegration between the exchange rates of Korea versus Japan, and Taiwan versus the United States.

Based on 1986-92 survey data of 22 midstream petrochemical industries in Taiwan, **Wang** and **Wu** show that Taiwan's petrochemical firms absorb only about 7 percent of a given weighted exchange rate change in their export prices. A 1 percent exchange rate change causes their markup ratio or price-cost margin to increase by 19 percent. This implies that Taiwan's petrochemical firms have a weak pricing-to-market pattern, because both the domestic and the foreign markets are either oligopolistic or monopolistic. However, the impacts of the exchange rate change on the export price, markup ratio, and price-cost margin had a tendency to increase during 1987-92. This tendency might be attributable to increasing competitiveness of the petrochemical markets in the world, or to Taiwanese firms' gradual realization of the importance of holding their world market shares in response to the change in the exchange rate.

Wu suggests that the real exchange rates between the Taiwanese and the U.S. dollars did not move as purchasing power parity predicts. Also, through analyses of impulse response functions, he finds that innovations in nominal exchange rates and domestic and foreign prices result in permanent changes in the real exchange rate.

Finally, Wu concludes that in the long run, differential productivity growth between traded and non-traded goods, and changes in relative unit labor costs, can lead to changes in real exchange rates.

Kwan and **Lui** discuss the historical background and institutional details of Hong Kong's currency board. They argue that its experience provides some opportunity for testing the macroeconomic implications of a currency board regime. They show that the parameters of the structural equation and the characteristics of supply and demand shocks have changed significantly since adoption of the regime. Variance decomposition, impulse response functions, and counterfactual exercises indicate that the satisfactory performance of Hong Kong's currency board has been caused by a combination of particularly favorable factors. Nevertheless, the danger of monetary collapse still exists.

Zhaoyong focuses on the dynamic relationships between the exchange rate of the renminbi and China's trade balance, its price, and its quantity components between January 1991 and February 1996. He shows a strong causal link running from the trade balance and each of its components to the exchange rate, but finds no J-curve in China's trade balance. Finding a bidirectional causal relationship between the movements in the exchange rate and the price variables confirms the presence of a "vicious circle," implying that currency devaluation has an inflationary effect.

Eichengreen and **Rose** compare different channels by which currency crises spread "contagiously" from one country to another. Using over 30 years of panel data from over 20 industrialized countries, they find strong evidence that

contagion spreads more easily to countries that are closely tied by international trade linkages than to countries in similar macroeconomic circumstances.

Sachs finds that economic structure, in addition to economic policy, has affected the capacity of developing countries to enjoy manufacturing-export-led growth in the past 30 years. The labor-abundant developing countries of East Asia have tended to export manufactures, while the land and resource-abundant developing countries of Latin America have tended to export mining and agricultural products. Theory suggests that resource abundance will cause a high price of nontradable goods (that is, a real exchange rate appreciation); that will squeeze out manufacturing production. Assuming that productivity growth is concentrated in manufactures, the resource-abundant economies can get stuck in a trap of a strong real exchange rate and low growth. In fact, Latin America, compared with East Asia, is characterized by: 1) a high price of nontradables; 2) a low share of exports in manufactures; 3) low economic growth; and 4) a tendency toward real depreciation over time (in contrast to long-run real appreciation in many economies of East Asia).

The proceedings of this conference will be published by the University of Chicago Press. The release of this volume will be announced in an upcoming issue of the *Reporter*.



Bureau News

Public Economics Program Meeting

Members and guests of the NBER's Program in Public Economics met in Cambridge on April 11-12. Program Director James M. Poterba, NBER and MIT, organized this agenda:

Caroline Minter Hoxby, NBER and Harvard University, "All School Finance Equalizations Are Not Created Equal: Marginal Tax Rates Matter"

Discussant:

Thomas J. Nechyba, NBER and Stanford University

Sören Blomquist, Uppsala University, and

Whitney Newey, MIT, "Nonparametric Estimation of Labor Supply Functions Generated by Piecewise Linear Budget Constraints"

Discussant:

Robert Triest, Federal Reserve Bank of Boston

James Andreoni, University of Wisconsin,

William Gale, Brookings Institution; and

J. Karl Scholz, NBER and University of Wisconsin, "Charitable Contributions of Time and Money"

Discussant:

Gilbert E. Metcalf, NBER and Tufts University

Anne C. Case and

Angus S. Deaton, NBER and Princeton University, "Large Cash Transfers to the Elderly in South Africa" (NBER Working Paper No. 5572)

Discussant:

Peter A. Diamond, NBER and MIT

Joseph G. Altonji, NBER and Northwestern University;

Fumio Hayashi, NBER and Columbia University; and

Laurence J. Kotlikoff, NBER and Boston University, "Parental Altruism and Inter Vivos Transfers: Theory and Evidence"

Discussant:

Donald Cox, Boston College

David F. Bradford, NBER and Princeton University, and

Derrick A. Max, American Enterprise Institute, "Implicit Budget Deficits: The Case of a Mandated Shift to Community-Rated Health Insurance"

Discussant:

David M. Cutler, NBER and Harvard University

Robert Carroll, Ernst & Young LLP;

Douglas J. Holtz-Eakin, NBER and Syracuse University;

Mark Rider, U.S. Treasury Office of Tax Analysis; and

Harvey S. Rosen, NBER and Princeton University, "Income Taxes and Entrepreneurs' Use of Labor"

Discussant:

Leslie E. Papke, NBER and Michigan State University

Using formulas for state equalization and other state aid, **Hoxby** calculates the marginal tax price of spending for each school district in the United States for 1972, 1982, and 1992. She finds that school finance equalizations do lower the average level of per-pupil spending. Poor districts enjoy small increases in spending under foundation aid programs. "Strong power equalization" and guaranteed tax base programs tend to generate such a large decrease in average spending, however, that even poor

districts experience a loss in spending.

Blomquist and **Newey** suggest that labor supply can be viewed as a function of the entire budget set. They apply parametric and nonparametric labor supply functions to calculate the effect of recent Swedish tax reforms. The nonparametric and parametric labor supply functions qualitatively give the same results. Recent tax reform in Sweden has increased labor supply by a small but economically important amount.

Andreoni, **Gale**, and **Scholz**

develop a simple framework for analyzing a household's decisions about philanthropic activity. They examine the model's predictions using a nationally representative survey conducted in 1990 that contains detailed information on hours volunteered, cash contributions, and a variety of economic and demographic variables. Their estimate of the elasticities of monetary gifts is considerably smaller than most published estimates. This is consistent with the fact that the time-series pattern of contributions

exhibits a fairly stable upward trend over periods of significant variation in tax rates. They find, on average, that gifts of time and money are gross complements. However, using a compensated notion of substitution, gifts of time and money appear to be substitutes. The policy simulations in this paper show that tax policy can influence charitable giving.

Case and Deaton examine the social pension in South Africa, where large cash sums—about twice the median per capita income of African households—are paid to people qualified by age, irrespective of their previous contributions. The authors use a 1993 nationally representative survey to investigate the redistributive consequences of the transfers, documenting those who receive the pensions, their levels of living, and those of their families. They also look at the effects of the cash receipts of the allocation of income to food, schooling, transfers, and savings. Further, they look for relationships between pension receipts and other “direct” indicators of welfare: the nutritional status of children, access to health care, and the ownership of major consumer durables. They conclude that pension income is spent in much the same way as other in-

come, so that “a rand is a rand” regardless of its source.

Altonji, Hayashi, and Kotlikoff use data on the extended family to test whether inter vivos transfers from parents to children are motivated by altruism. Specifically, they ask whether an increase of one dollar in the income of parents actively making transfers to a child, coupled with a one-dollar reduction in that child’s income, results in the parents increasing their transfer to the child by one dollar. They reject the altruism hypothesis, though. They find that redistributing one dollar from a recipient child to donor parents leads to less than a 13-cent increase in the parents’ transfer to the child.

Bradford and Max analyze a regulatory program that would mimic deficit financing in effecting a transfer of fiscal burdens toward younger and future generations: the mandated purchase of (or provision by employers of) health care insurance under a system of community rating, under which the same price is charged for health insurance for all comers, regardless of age, sex, or health condition. Using data from a variety of sources, the authors conclude that the effect of such a program would be

substantial. A shift to community rating could generate gains for people over age 30 in 1994—\$16,700 per person aged 50, for example—at the cost to younger cohorts. Those born in 1994 would acquire an extra payment obligation with a discounted value of \$7100 each. The burden passed along to future generations can be described by a \$9300 per capita tax at birth (growing with productivity).

Carroll, Holtz-Eakin, Rider, and Rosen investigate the effect of entrepreneurs’ personal income tax situations on their use of labor. Analyzing the income tax returns of a large number of sole proprietors before and after the Tax Reform Act of 1986, they find that individual income taxes exert a statistically and quantitatively significant influence on the probability that an entrepreneur hires workers. A 6 percentage point reduction in the marginal tax rate of entrepreneurs in the 39.6 percent bracket induces an approximately 12.7 percent increase in the probability that they hire labor. Further, taxes also influence the total wage payments to those newly hired workers. The elasticity of the median wage bill with respect to the marginal tax rate is about 0.214.



Productivity Program Meeting

Over 30 members and guests of the NBER's Program on Productivity met in Cambridge on April 19. Program Director Zvi Griliches, Harvard University, organized this agenda:

Paul Armknecht, International Monetary Fund, "Improving Efficiency in the U.S. CPI in the Future"

Discussant:

Matthew D. Shapiro, NBER and

University of Michigan

Robert J. Gordon, NBER and Northwestern University, "Quality Change and New Goods: The Sears Catalog Revisited"

Discussant:

David W. Wilcox, Federal Reserve Board

Dale W. Jorgenson, Harvard University, and

Daniel Slesnick, University of Texas, "The Cost of Living"

Discussant:

Lawrence F. Katz, NBER and Harvard University

David M. Cutler, NBER and Harvard University,

Mark B. McClellan, NBER and Stanford University, and

Joseph Newhouse and

Dahlia Remler, Harvard University, "Price Indexes for Heart Attack Episodes"

Discussant:

Jonathan Gruber, NBER and MIT

Armknecht discusses some of the practical issues involved in improving the U.S. Consumer Price Index (CPI), including the potential sources of cost savings related to probability sampling. He also considers various methods of quality adjustment that currently are used in the CPI. He concludes with a number of recommendations involving statistical policy that would be necessary for achieving efficiencies and improvements.

Gordon links into a price index successive comparisons of prices of identical models from the Sears catalogs of adjacent years. He finds that the Sears price index for apparel grows at roughly the same rate as the CPI from 1978 to 1993, but at a much faster rate during 1978-84, and a much slower rate from 1984-93. Further, apparel and durable goods indexes for 1914-47 exhibit considerably more price flexibility during the Great Depression than official government price indexes do.

Various estimates of the cost of

living are used to index 30 percent of federal expenditures, but the CPI is ill-suited for this purpose, since it is seriously biased. **Jorgenson** and **Slesnick** present cost-of-living indexes for the United States as a whole, and for different demographic groups. They conclude that inflation rates for these groups do not differ substantially.

Cutler, **McClellan**, **Newhouse**, and **Remler** describe three price indexes for the medical industry: an input price index; a treatment price index; and a cost-of-living index. They apply these indexes to the treatment of heart attacks using data from a major teaching hospital, and from Medicare between 1983 and 1994. They reach three conclusions: First, because of technological change, the change in measured input price is four times as large when the inputs are held constant as when they are rebased annually. Second, shifting from disaggregated inputs to courses of treatment results in further declines in measured price increases. Third,

the results for the cost-of-living index depend heavily upon assumed values placed on an additional year of life. For plausible values, the real price of heart attack treatment fell by about 0.6 percent per year between 1983 and 1994.

The meeting concluded with two roundtable discussions, the first on how to treat new goods in the CPI, and the second on estimating the cost of living with indexes other than the CPI. The leaders of the first discussion were: W. Erwin Diewert, NBER and University of British Columbia; Jerry A. Hausman, NBER and MIT; Brent Moulton, Bureau of Labor Statistics; and Ariel Pakes, NBER and Yale University. The second discussion group was led by William D. Nordhaus, currently of NBER and Yale University and a member of the Council of Economic Advisers under President Jimmy Carter; Zvi Griliches; and Alan S. Blinder, currently of NBER and Princeton University, and formerly a member of the Federal Reserve's Board of Governors.

Labor Economists Meet

Forty members and guests of the NBER's Program in Labor Studies gathered in the Bureau's Cambridge office on April 26 for their spring meeting. Program Director Richard B. Freeman, also of Harvard University, organized this agenda.

Henry S. Farber, NBER and Princeton University, "The Changing Faces of Job Loss in the United States, 1981-93" (NBER Working Paper No. 5596)

Daron Acemoglu and **Jorn-Steffen Pischke**, MIT, "Why Do Firms Train? Theory and Evidence"

Ann H. Stevens, NBER and Rutgers University, "Climbing Out of Poverty, Falling Back In: Measuring the Persistence of Poverty Over Multiple Spells" (NBER Working Paper No. 5390)

Canice Prendergast, NBER and University of Chicago, and **Lars Stole**, University of Chicago,

"Impetuous Youngsters and Jaded Old-Timers: An Analysis of Behavioral Decisionmaking Rules"

Harry Holzer, Michigan State University, and

David Neumark, NBER and Michigan State University, "Are Affirmative Action Hires Less Qualified? Evidence from Employer-Employee Data on New Hires" (NBER Working Paper No. 5603)

Farber finds that the overall rate of job loss is up somewhat in the 1990s. The increase is larger for older and more-educated workers, although younger and less-educated workers continue to have the highest rates of job loss. The more-educated workers suffer less displacement-related economic loss relative to their income than the less-educated workers do: they have higher post-displacement employment rates; are more likely to be employed full time; have more stable employment histories; and suffer smaller proportional earnings losses on average. Further, older workers and the better educated are more likely to turn to self-employment.

In the standard human capital model, workers pay for the acquisition of general skills at work through lower wages. **Acemoglu** and **Pischke** present an alternative model in which firms bear the investment cost in general skills-based training. They argue that their model is consistent with the prevalence of firm-financed ap-

prenticeship training in Germany and the absence of similar levels of such training in the United States.

Stevens uses a spells approach to investigate the persistence of poverty over individuals' lifetimes. Her findings emphasize the importance of considering multiple spells when analyzing the persistence of poverty. For black and white individuals who fall into poverty in a given year, she finds, approximately 50 and 30 percent respectively will have family income below the poverty line in at least five of the next ten years. A single-spells approach predicts comparable figures of only 26 and 13 percent.

Prendergast and **Stole** consider how individuals make decisions that reflect on their competence. They show that a manager making investment decisions on a project over time initially will exaggerate his own information. Ultimately the manager will become too conservative, and unwilling to change the investments on the basis of new information. These results relate to work in psychology about reduc-

ing cognitive dissonance. The authors show that decisionmaking biases—known as the sunk cost fallacy and the base rate fallacy—arise naturally in their framework.

Holzer and **Neumark** use microlevel data on employers and employees to investigate whether minority and/or female employees hired under affirmative action procedures are less qualified or less productive, relative to white males, than those hired in firms without such procedures. Their measures of qualifications include the educational attainment of the workers hired (both absolutely and relative to job requirements), the skill requirements of the job for which they are hired, and a variety of measures related to worker performance on the job. Based on a representative sample of over 3200 employers in four major metropolitan areas in the United States, they find some evidence of lower educational qualifications among blacks and Hispanics hired under affirmative action, but not among white women.

Health Care

Thirty members and guests of the NBER's Program on Health Care attended a working meeting in Cambridge on May 2. Program Director Alan M. Garber, also of Stanford University, organized the discussion. The presentations were:

David M. Cutler and **Douglas O. Staiger**, NBER and Harvard University, "Determinants of Technological Progress

in Medical Care"

Mark B. McClellan, NBER and Stanford University, "The Marginal Returns to Technological Change: Heart Attacks in the Elderly"

Jonathan S. Skinner, NBER and Dartmouth College, "Regional Variation in Health Care Resources: Implications for Health Outcomes"

Victor R. Fuchs, NBER and Stanford University, "Why Do Health Economists Disagree About Policy?"

Thomas E. MaCurdy, NBER and Stanford University; **Mark B. McClellan**, and **Alan M. Garber**, "Trends in Persistence in Medicare Expenditures"

Cutler and **Staiger** examine how innovations in medical care over time have improved survival for patients facing acute life-threatening situations, and to what extent these innovations provide lasting improvements in patient survival. Their study evaluates survival among patients admitted to an acute care hospital between 1974 and 1987. Controlling for changes in demographics, they find that mortality rates one year after a hospital admission have fallen, but that mortality rates nearer to the date of admission have fallen even more. On net, they estimate that over time, only half of increases in short-run survival rates persist to the end of the year; across hospitals, less than 25 percent of increases in short-run survival are associated with survival to one year.

Many health care experts have argued that technological change in health care mostly has been worth its additional cost, but that the U.S. health care system may encourage too much technological change. **McClellan** presented empirical evidence on the returns to technological change in the treatment of heart attacks in the elderly. New medical technologies tend to be adopted first by teaching hospi-

tals and large hospitals with intensive procedure capabilities. Consequently, comparing trends in outcomes and costs at these "technology-leading" hospitals to trends at other hospitals provides a basis for estimating the incremental value of new technological changes. Between 1984 and 1991, both survival and real medical expenditures per heart attack patient increased substantially. Expenditures rose more rapidly and survival improvements were greater at the technology-leading hospitals, suggesting that the additional new technologies adopted by these hospitals led to lower mortality at higher cost. However, the additional survivors were more likely to develop complications of heart disease, such as further heart attacks and heart failure.

There is widespread variation in the level of health care resources and utilization across regions in the United States, a phenomenon known as "small area variation." **Skinner** discussed new regional mappings, from the Dartmouth Atlas of Health Care, that quantified these areas. This work allows researchers to infer whether residents of a particular zip code: are, on average, treated aggressively or conservatively for a given disease; are

subject to high levels of underlying health problems (such as acute myocardial infarction, stroke, or certain forms of cancer); or have a large number of hospital beds or specialists per capita in their region. He also discussed one application using data from the atlas: whether residents of areas with a greater concentration of hospital beds per capita experienced better health.

Fuchs presented results of a survey of health economists that was designed to determine the contributions of differences in *values* and differences in perceptions of *facts* to different opinions about health policy reforms. In a previous study, Fuchs had found that health economists tended to agree on the answers to a number of positive questions, but tended to disagree about policy. The new survey revealed that health economists' opinions about aspects of Republican and Democratic health insurance reforms tended to correlate with their views about the importance of universal insurance coverage, along with their attitudes about individual and social responsibilities for social welfare.

MaCurdy presented joint work with **McClellan** and **Garber** on

trends in Medicare expenditures and the persistence of individual Medicare expenditures between 1986 and 1990. Hospital expenditure growth was greatest at the upper percentiles of the distribution of expenditures, especially for the youngest age cohort (turned 65 in 1986). Part B (primarily outpatient) reimbursements rose sharply, then declined slightly for the 90th percentile, and experienced low rates of growth for the 10th and 50th percentiles. Analysis of the expenditures of individual Medicare re-

cipients over time showed a high degree of persistence; many of the patients with persistently high expenditures had chronic diseases such as heart failure, ischemic heart disease, occlusive stroke, and so on.

In addition to those already mentioned, the following NBER associates participated in the discussions: Laurence C. Baker, Stanford University; Daniel R. Feenberg; Bureau President Martin Feldstein, Paul J. Gertler, and David A. Wise, Harvard University; Sherry A. Glied, Columbia University; Jonathan Gru-

ber and James M. Poterba, MIT; Michael Hurd, RAND Corporation; and Richard Woodbury. Other attendees included: Kate Baicker, Susan Ettner, Jeff Geppert, Jack Needleman, Joseph Newhouse, Dahlia Rembler, and Winnie Yip, Harvard University; Matthew Eichner, MIT; Korinna Hansen, Wellesley College; Stephen T. Parente, Project HOPE Center for Health Affairs; Tomas Philipson, University of Chicago; and Amy Taylor, Agency for Health Care Policy and Research.

Asset Pricing

Members and guests of the NBER's asset pricing program met in Cambridge on May 3. Robert F. Stambaugh, NBER and University of Pennsylvania, organized this program.

Wayne E. Ferson, NBER and University of Washington, and **Connie Becker**, **David Meyers**, and **Michael Schill**, University of Washington, "Conditional Market Timing with Benchmark Investors"

Discussant:
Peter Knez, University of Wisconsin

John H. Cochrane, NBER and University of Chicago, and **Jesús Sáa-Quejo**, University of Chicago, "Beyond Arbitrage: 'Good Deal' Asset Price Bounds

in Incomplete Markets" (NBER Working Paper No. 5489)

Discussant:
Ravi Jagannathan, University of Minnesota

Bernard Dumas, NBER and HEC School of Management; **Jeff Fleming**, Rice University; and **Robert Whaley**, Duke University, "Implied Volatility Functions: Empirical Test"

Discussant:
Steven Heston, Washington University

Robert F. Engle, NBER and University of California, San Diego, and

Jeffrey Russell, University of California, San Diego, "Autoregressive Conditional Duration: A New Model for Irregularly Spaced Transaction Data"

Discussant:
A. Craig Mackinlay, NBER and University of Pennsylvania
Torben Andersen, Northwestern University, and **Jesper Lund**, Aarhus School of Business (Denmark), "Stochastic Volatility and Mean Drift in the Short-Term Interest Rate Diffusion: Sources of Steepness, Level, and Curvature in the Yield Curve"

Discussant:
George Tauchen, Duke University
Andrew B. Abel, NBER and University of Pennsylvania, "Risk Premia and Term Premia in General Equilibrium"

Discussant:
John Y. Campbell, NBER Asset Pricing Program Director, and Harvard University

Becker, Ferson, Meyers, and Schill develop and test new models to measure the ability of mutual funds to time the stock market. Their models have three distinctive features: 1) they distinguish market timing based on certain well-known, publicly available information from timing based on superior information; 2) they incorporate the idea that funds may be concerned primarily with their returns, measured relative to a benchmark such as the Standard & Poor's 500 Index; and 3) they allow for estimation of the different effects of the manager's risk aversion and the quality of the available information about future market moves. Using a sample of more than 400 U.S. mutual funds for 1976-94, the authors find that controlling for the effects of publicly known variables, such as interest rates and dividend yields, improves upon earlier models. Further, some mutual funds do behave as if they focus on their returns, measured relative to a benchmark. However, after controlling for the public information variables, there is no evidence that funds have significant market timing ability.

It is often useful to price assets and other random payoffs by referring to other observed prices, rather than by constructing full-fledged economic asset pricing models. This approach breaks down if there is no perfect replicating portfolio. **Cochrane and Saá-Requejo** impose weak economic restrictions to derive usefully tight bounds on asset prices in this situation. The bounds basically rule out high Sharpe ratios—"good deals"—as well as arbitrage opportunities.

Black and Scholes (1973) implied volatilities tend to be related systematically to the option's exercise price and the time to expira-

tion. Derman and Kani; Dupire; and Rubinstein (all 1994) attribute this to the fact that the Black/Scholes constant volatility assumption is violated in practice; their deterministic volatility function (DVF) option valuation model has the potential of fitting the observed cross section of option prices exactly. Using a sample of S&P 500 Index options during June 1988 through December 1993, **Dumas, Fleming, and Whaley** evaluate the economic significance of the implied DVF by examining the predictive and hedging performance of the DVF option valuation model.

Engle and Russell propose a new statistical model for the analysis of data that do not arrive in equal time intervals, such as financial transactions data, telephone calls, or sales data on commodities that are tracked electronically. The model treats the time between events as a stochastic, time-varying process. There is strong evidence of transaction clustering in the financial transactions data analyzed, even after time-of-day effects are removed. Although the model is applied most naturally to the arrival of transactions, it can be modified to model processes that are observed in irregular time intervals.

Andersen and Lund show that it is possible to capture all the main structural features of the short-term interest rate process in an intuitively appealing and fairly manageable nonlinear, three-factor continuous-time model. The factors represent shocks to the short rate itself, the volatility of the process, and a time-varying mean level toward which the short rate reverts. The factors may be identified with forces that induce shifts in the steepness, level, and curvature of the yield curve. Thus, the representation is consistent with the set of stylized

facts established by Litterman and Scheinkman in the late 1980s regarding the importance of such factors in term structure modeling.

The equity premium consists of a term premium reflecting the longer maturity of equity relative to short-term bills, and a risk premium reflecting the fact that equity is a claim on stochastic payoffs but riskless bills are claims on known payoffs. **Abel** analyzes term and risk premiums in a general equilibrium asset pricing model. He derives closed-form solutions for moments of asset returns, and presents first-order approximations to illustrate the effects of various parameters. Numerical calibration indicates that catching-up-with-the-Joneses preferences, combined with leverage, can account for the moments of asset returns.



Behavioral Finance

Over 30 participants in the NBER's project on behavioral finance met in Cambridge on May 4. Robert J. Shiller, Yale University, and Richard H. Thaler, University of Chicago, organized this program.

Kent Womack, Dartmouth College, and

Roni Michaely, Cornell University, "Conflicts of Interest and the Credibility of Underwriters' Analysts' Recommendations"

Discussant:
Jay Ritter, MIT

Owen Lamont, NBER and University of Chicago;

Peter Klibanoff, Northwestern University; and

Thierry A. Wizman, Strategic Investment Partners, "Investor Reaction to Salient News in Closed-End Country Funds" (NBER Working Paper No. 5588)

Discussant:
Andrei Shleifer, NBER and Harvard University

Torrance Odean, University of California, Berkeley, "Are Investors Reluctant to Realize Their Losses?"

Discussant:
James M. Poterba, NBER and MIT
Kenneth A. Froot, NBER and Harvard University, and
Emil Dabora, Harvard University, "How Are Stock Prices Affected by the Location of Trade?"

Discussant:
Jeffrey Pontiff, University of Washington

Jeremy C. Stein, NBER and MIT, "Rational Capital Budgeting in an Irrational World"

Discussant:
Luigi Zingales, NBER and University of Chicago

Robert B. Barsky,
Miles S. Kimball, and
Matthew D. Shapiro, NBER and University of Michigan; and
F. Thomas Juster, University of Michigan, "Preference Parameters and Behavioral Heterogeneity: An Experimental Approach in the Health and Retirement Survey" (NBER Working Paper No. 5213)

Discussant:
Robert J. Shiller

Womack and **Michaely** compare recommendations made by underwriters and nonunderwriters of companies that conducted initial public offerings in 1990-1. They show that underwriters' "buy" recommendations performed poorly for stocks that they had underwritten (relative to recommendations by nonunderwriters) prior to, at the time of, and subsequent to the recommendation date. They also demonstrate the substantial conflicts of interest inherent in the different functions that investment bankers perform; these conflicts of interest bias their views and their recommendations of the firms they take public.

Lamont, **Klibanoff**, and **Wizman** provide a model of closed-end fund pricing that includes investors who do not form expectations correctly, and allows for salient country-specific news to

affect the process of forming expectations. They use panel data on prices and net asset values of closed-end country funds to examine investor reaction to news that affects fundamentals; they measure the response of the idiosyncratic change in fund prices to the idiosyncratic change in fund asset values. In a typical week, U.S. prices underreact to changes in foreign fundamentals: the (short-run) elasticity of prices with respect to asset values is significantly less than one. In weeks with major news (relevant to the specific country) appearing on the front page of the *New York Times*, prices react much more to fundamentals: the elasticity of prices with respect to asset values is about one. Major news events apparently lead some investors who normally lag behind in updating their expectations to react more quickly.

Odean tests the disposition effect—that is, the tendency of investors to hold losing investments too long and to sell winning investments too soon—by analyzing trading records for 10,000 accounts at a large discount brokerage house. These investors demonstrate a strong preference for realizing winners rather than losers. Their behavior does not appear to be motivated by a desire to rebalance portfolios, or to avoid the higher trading costs of low-price stocks, nor is it justified by subsequent portfolio performance. For taxable investments, the behavior is not optimal and leads to lower aftertax returns.

Froot and **Dabora** examine pairs of large "Siamese twin" companies whose stocks are traded around the world but have different trading and ownership habits. The twins pool cash flows; with integrated markets, the twin stocks

would move in lockstep. Instead, the relative prices of twin stocks appear excessively correlated with the markets on which they are most intensively traded. For example, a twin's price rises relative to the other when the market on which it is rather intensively traded rises, and falls when the market where it is less intensively traded rises. The authors examine several explanations for this phenomenon: the discretionary use of dividend income by parent companies; differences in parent company expenditures; voting rights issues; currency fluctuations; ex-dividend-date timing issues, and tax-induced investor heterogeneity. Taken together, these explanations do not appear to fit all of the facts. The re-

sults are consistent with the hypothesis that: 1) country-specific sentiment shocks affect share price movements of locally traded stocks in proportion to their local trading/ownership intensity; or 2) markets are segmented for reasons other than international transactions costs.

Suppose that cross-sectional differences in stock returns can be predicted based on variables other than beta (such as book-to-market), and that this predictability reflects market irrationality rather than compensation for fundamental risk. In this setting, how should companies determine hurdle rates? **Stein** shows how factors such as managerial time horizons and financial constraints affect the optimal hurdle rate. Under some circum-

stances, beta can be useful as a capital budgeting tool, even if it is of no use in predicting stock returns.

Barsky, Juster, Kimball, and Shapiro report on direct measures of preferences for risk tolerance, time, and intertemporal substitution based on survey respondents' choices in hypothetical situations. The majority of respondents fall into the least risk-tolerant group, but a substantial minority display higher risk tolerance. The mean risk tolerance is 0.25; the mean elasticity of intertemporal substitution is 0.2. Measured risk tolerance is related positively to a number of behaviors, including smoking, drinking, failing to have insurance, and holding stocks rather than Treasury bills.

Japan Project Meets

The NBER's Working Group on Japan, directed by Anil K. Kashyap, University of Chicago, held its second annual meeting in Cambridge on May 4. The program was:

Adrian A. R. J. M. van Rixtel, De Nederlandsche Bank, and
Wolter H. J. Hassink, Free University of Amsterdam,
"Monitoring the Monitors: Retired Ministry of Finance and Bank of Japan Officials and the Ex Post Monitoring of Japanese Banks"

Discussant:
Luigi Zingales, NBER and University of Chicago

J. Mark Ramseyer, University of Chicago, and

Eric B. Rasmussen, Indiana University, "Judicial Independence in Civil Law Regimes: Econometrics from Japan"

Discussant:
Stewart Schwab, Cornell University

Lynne G. Zucker and
Michael A. Darby, NBER and University of California, Los Angeles, "The Diffusion of Biotechnology in Japan: Scientists, Institutions, and Firms"

Discussant:
Samuel S. Kortum, NBER and Boston University

Albert Ando, NBER and University of Pennsylvania, and

Andrea Moro, University of Pennsylvania, "Demographic Dynamics, Labor Force Participation, and Household Asset Accumulation: Case of Japan"

Discussant:
Christina H. Paxson, NBER and Princeton University

Nobuhiro Kiyotaki, NBER and University of Minnesota, and
Kenneth D. West, NBER and University of Wisconsin, "Business Fixed Investment and the Recent Business Cycle in Japan" (NBER Working Paper No. 5546)

Discussant:
Takeo Hoshi, University of California, San Diego

Van Rixtel and **Hassink** investigate whether Japanese monetary authorities use post-retirement employment of Ministry of Finance (MOF) and Bank of Japan (BOJ) officials as a policy instrument. The authors also investigate whether industrial groupings (keiretsu) and main banks have monitoring functions. They find that MOF and BOJ retirees do move into banks that perform badly in terms of profitability and solvency. However, the authors reject hypotheses of main bank and keiretsu monitoring for most samples and specifications.

Ramseyer and **Rasmussen** use data from the Japanese courts to explore the general determinants of career success and to test how extensively the government manipulates those incentives toward political ends. They find that the government rewards the smartest and hardest-working judges. There is little evidence of ongoing school cliques, nor that the Japanese system rewards judges who mediate versus those who adjudicate. Rather, the judges who do best are those who publish the most opinions. However, on the political side, judges who joined a prominent leftist organization in the 1960s were still receiving less attractive jobs than their peers in the 1980s. Those who decided cases against the government on average received less attractive assignments

over the next several years; and those judges who decided a high percentage of cases against the government early in their careers were still receiving less attractive jobs than their peers in the 1980s.

Zucker and **Darby** went to Japan and interviewed biotech scientists, industry executives, government officials, and officers of intermediating organizations. Their interviews uncovered three major factors that interact to deter the formation of new biotechnology firms there: the closed nature of the Japanese system of higher education, and noncompetitive research funding; incompleteness of the capital markets, especially the lack of a national venture capital industry capable of financing new firms, and the related absence of initial public offerings prior to a firm's achieving substantial profitability; and cultural characteristics and incentive systems that discourage Japanese entrepreneurialism in general, and affect scientists in particular. Zucker and Darby conclude that these factors explain both the low level of formation of new biotechnology firms and the smaller impact (in Japan versus the United States) of intellectual capital on resources that affect the births of new biotechnology enterprises.

Ando and **Moro** estimate the pattern of aggregate income, saving, and asset accumulation for Ja-

pan from 1985–2090 under alternative assumptions about fertility. Their results suggest that the saving-income ratio will increase slightly in the immediate future as the number of children per family declines, and then will fall moderately as the proportion of older persons in the population increases. Unless some major changes in Japanese saving behavior take place, Japan will have an unusually high net worth/income ratio as its population stabilizes or begins to decline.

Kiyotaki and **West** analyze fixed business investment in Japan, which has been unusually volatile in recent years. They find that movements in business fixed investment are consistent with movements in output and in the tax-adjusted cost of capital, both on average during their entire 1961–94 sample, and during the recent 1986–94 business cycle.

Also attending were: Charles Y. Horioka, NBER and Osaka University; Takatoshi Ito, International Monetary Fund; Tokuo Iwaisako and David Weinstein, Harvard University; Ravi Jagannathan, University of Minnesota; Laurence J. Kotlikoff, NBER and Boston University; David Laibson, NBER and Harvard University; Robert E. Lipsey, NBER and Queens College; and Mariko Sakakibara, University of California, Los Angeles.

Higher Education

Members of the NBER's Project on Higher Education, directed by Charles T. Clotfelter, also of Duke University, met in Cambridge on May 23. They discussed these topics:

Ronald G. Ehrenberg, NBER and Cornell University, and

Peter J. Hurst, Cornell University, "The 1995 NRC Ratings of Doctoral Programs: A Hedonic Model"

Discussant:
Zvi Griliches, NBER and Harvard University

Gordon C. Winston and
Ivan C. Yen, Williams College,

"Costs, Prices, Subsidies, and Aid in U.S. Higher Education"

Discussant:
John Siegfried, Vanderbilt University

Thomas J. Kane, NBER and Harvard University, "Racial Preference in College Admissions"

Continued on page 37

Discussant:

Michael Rothschild, NBER and Princeton University

Caroline Minter Hoxby, NBER and Harvard University, "Autarky to Integration: Rising Compensation Among Providers of Higher Education and Its Effects on Tuition, Faculty Salary, Research Funding, and Student Placement" (work in progress)

Michael Darby and

Lynn Zucker, NBER and University of California, Los Angeles, "Research Universities and Stand-Alone Research Institutes: A Cross-Country Comparison of National Innovative Systems" (work in progress)

Irwin Feller, Pennsylvania State University, "Social Contracts and Institutional Support of Academic Research"

Discussant:

Jerry R. Green, NBER and Harvard University

Stephen A. Hoenack, University of Minnesota, "Applying a Model of the Interacting Behavioral Relationships That Shape Higher Education's Outcomes"

Discussant:

Richard Murnane, NBER and Harvard University

Ehrenberg and **Hurst** analyze how measured program size, faculty seniority and research productivity, and faculty productivity in producing doctoral degrees, influence ratings of doctoral programs in 35 academic fields. With this methodology, university administrators can compute the impact of changing the number of faculty positions allocated to a field on the ranking of its programs. Finally, Ehrenberg and Hurst show how administrators can "decompose" the differences between a department's rating and the ratings of a group of higher-ranked departments in the field into what is attributable to faculty size, seniority, research productivity, and productivity in producing doctoral students.

Winston and **Yen** ask, "Which colleges and universities grant how much subsidy, and in what form?" They use 1991 enrollment and financial data from 2687 U.S. colleges and universities to describe price, costs, and aid patterns for public and private institutions by "Carnegie type," and by size distribution of the subsidies among schools. These appear to be defining characteristics of both individual colleges and universities and, more fundamentally, of the economic structure of higher education.

Kane evaluates the extent of ra-

cial preference in college admissions and its impact on B.A. completion rates and earnings of college entrants ten years after high school graduation. He finds that although black and Hispanic youth enjoyed large advantages at elite institutions (those with reported mean SAT scores in the top quintile), there was little evidence of racial preference at the institutions where 80 percent of four-year college students enroll. After he corrects for measurement error in the SAT scores reported by colleges, Kane finds that both black and white youth enjoyed higher earnings and higher B.A. completion rates when attending colleges with higher mean SAT scores, holding constant their own test scores and family background.

Since 1960, higher education has been transformed from a collection of local college markets to a market that is national for elite students and regional for many others. **Hoxby** uses data on more than 5000 colleges since the mid-1960s to test economic predictions for this increasingly integrated market. She asks, for example, does competition explain the rise in real tuition? Have faculty salaries departed from the compressed schedules originally adopted to promote collegiality and research integrity? Has increas-

ing rivalry stimulated the innovativeness of research, and is this why U.S. higher education is competitive internationally? And, finally, has competition made state subsidies a less viable means of supporting public colleges?

Darby and **Zucker** discuss their ongoing work on the implications for technology transfer of whether a country's national innovation system places relatively more emphasis on research universities or stand-alone research institutes. Their preliminary evidence suggests that research universities are more likely to result in scientist/firm collaborations than research institutes are. Zucker and Darby now are investigating the various organizational constraints, particularly incentive systems, that might account for these differences.

Feller notes that existing data on institutional expenditures for academic R and D do not adequately address issues relating to the structure of the U.S. academic research system. Institutional expenditures as a proportion of total expenditures on academic R and D have risen from 11 percent in 1973 to nearly 18 percent in 1993. There are sizable differences, though, in the relative shares of institutionally funded R and D between private and public universities. These series

are subject to underreporting, non-comparability, and misspecification.

Higher education is a complex series of interactions between student "demanders" and diverse suppliers within universities. The asymmetries of information that are in-

herent in these interactions are exacerbated by higher education's finance mechanism. This mechanism also discourages efficiency of investment, diverts productive efforts to rent-seeking activities, and creates incentives that make research

compete unnecessarily with learning. Effective reforms will require specific changes in the finance mechanism. In this particular paper, **Hoенack** shows the potential role of risk-based student lending.

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Feldstein is president and CEO of the NBER and a professor of economics at Harvard University. He is a member of, and Poterba is director of, the NBER's Program in Public Economics. Poterba is also a professor of economics at MIT.

This volume costs \$45.00.

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Wise directs the NBER's Program of Research on Aging and is a professor at Harvard's Kennedy School of Government.

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NBER Working Papers

Why Does Inflation Differ Across Countries?

Marta Campillo and
Jeffrey A. Miron

NBER Working Paper No. 5540

April 1996

JEL Nos. E31, E58, E61

Monetary Economics

This paper attempts to explain the differences in inflation performance across countries. Earlier research has examined this topic, but has considered only some of the factors that might be empirically important determinants of inflation rates. We consider: the distaste for inflation; optimal tax considerations; time consistency issues; distortionary noninflation policies; and other factors that might be important. Overall, our results suggest that institutional arrangements—central bank independence, or exchange rate mechanisms—are relatively unimportant in determining inflation performance, while economic fundamentals, including openness and optimal tax considerations, are relatively important determinants.

Expectation Traps and Discretion

V. V. Chari,
Lawrence J. Christiano, and
Martin Eichenbaum

NBER Working Paper No. 5541

April 1996

JEL Nos. E32, E60

Economic Fluctuations and Growth

We argue that discretionary monetary policy exposes the economy to welfare-decreasing instability. It does so by creating the potential for private expectations about the response of monetary policy to exogenous shocks to be

self-fulfilling. Among the many equilibriums that are possible, some have good welfare properties. But others exhibit welfare-decreasing volatility in output and employment. We refer to the latter type of equilibriums as *expectation traps*. In effect, our paper presents a new argument for commitment in monetary policy, because commitment eliminates these bad equilibriums. We show that full commitment is not necessary to achieve the best outcome, and that more limited forms of commitment suffice.

Sulfur Dioxide Compliance of a Regulated Utility

**Don Fullerton,
Shaun P. McDermott, and
Jonathan P. Caulkins**

NBER Working Paper No. 5542
April 1996
JEL Nos. H23, H73, D6, Q25
Public Economics

Electric utilities can reduce sulfur dioxide emissions through a variety of strategies, such as adding scrubbers, switching to low-sulfur coal, or shifting output among generating plants with different emissions. The cost of achieving a given emission target can be minimized using a market for emission allowances, as under the Clean Air Act Amendments of 1990, if firms with high abatement costs buy allowances, while those with low abatement costs reduce emissions and sell allowances. However, public utility commissions regulate which costs can be passed to customers.

Previous theoretical work has analyzed the effects of regulations on a utility's choice of permits versus a single continuous "abatement technology." In this paper, we consider three abatement technologies and the discrete choices among them. Our numerical model uses market and engineering informa-

tion on permit prices, scrubber cost and efficiency in terms of sulfur removal, costs and sulfur content of alternative fuel, plus costs and efficiency of generating plants. We find that regulatory rules could more than double the cost of sulfur dioxide compliance.

U.S. Trade Policy and Cigarette Smoking in Asia

**Frank J. Chaloupka and
Adit Laixuthai**

NBER Working Paper No. 5543
April 1996
JEL No. I1
Health Economics

During the 1980s and early 1990s, the cigarette markets in Japan, Taiwan, South Korea, and Thailand were opened to U.S. cigarettes through actions taken under Section 301 of the 1974 Trade Act and its subsequent amendments. Using pooled annual time-series data from ten Asian countries, we examine the impact of the Section 301 agreements on the market share of U.S. cigarettes and on per capita cigarette consumption. Estimates from fixed-effects models indicate that the market share of U.S. cigarettes in Japan, Taiwan, South Korea, and Thailand increased dramatically after the agreements as consumers switched from the brands produced by domestic monopolies to the brands of U.S. cigarette producers. In addition, simulations based on the regression results indicate that per capita cigarette consumption in 1991 in the four affected countries was nearly 10 percent higher than it would have been had the markets remained closed to U.S. cigarettes.

Bounding the Effects of R and D: An Investigation Using Matched Establishment-Firm Data

**James D. Adams and
Adam B. Jaffe**

NBER Working Paper No. 5544
April 1996
JEL Nos. O31, O32
Productivity

Studies of firm-level data have shown that a firm's R and D and the R and D of other firms together increase conventional factor productivity. We investigate these phenomena further by examining the relationship between plant-level productivity and firm-level R and D. We find that: 1) the productivity-enhancing effects of parent firm R and D are diminished by geographic distance from the research lab and "technological" distance between the product-field focus of the R and D and the plants; 2) productivity appears to depend on the intensity of parent firm R and D (R and D per plant), not on the total amount of R and D; and 3) spillovers of research effects from technologically related firms are significant but also depend on R and D intensity rather than total industry R and D. These results suggest that, despite the externalities created by spillovers of R and D, the "dilution" of R and D across multiple target plants reduces its potency sufficiently that spillovers may not be a source of industrywide or economywide increasing returns.

Environment Regulation and Innovation: A Panel Data Study

**Adam B. Jaffe and
Karen Palmer**

NBER Working Paper No. 5545
April 1996
JEL Nos. Q28, O31
Productivity

In a 1991 essay in *Scientific American*, Michael Porter suggested that environmental regulation may have a positive effect on the performance of domestic firms relative to their foreign competitors, by stimulating domestic innovation. We examine the stylized facts on environmental expenditures and innovation with data from a panel of manufacturing industries. We find that [lagged] environmental compliance expenditures have a significant positive effect on R and D expenditures, when we control for unobserved industry-specific effects. We find little evidence, however, that industries' inventive output (as measured by successful patent applications) is related to compliance costs.

Business Fixed Investment and the Recent Business Cycle in Japan

Nobuhiro Kiyotaki and Kenneth D. West

NBER Working Paper No. 5546

April 1996

Economic Fluctuations and Growth

To analyze business fixed investment in Japan, which has been unusually volatile in recent years, we develop and apply a loglinear flexible accelerator model. We find that movements in business fixed investment are consistent with movements in output and the tax-adjusted cost of capital, both on average during our entire 1961–94 sample and during the recent 1986–94 business cycle.

Understanding the 20th Century Growth in U.S. School Spending

Eric A. Hanushek and Steven G. Rivkin

NBER Working Paper No. 5547

April 1996

JEL No. I2

Labor Studies

The persistent increase in spending on elementary and secondary schools has gone virtually undocumented. Real expenditure per student increased at 3.5 percent per year over the entire century from 1890 to 1990. A decomposition of the spending growth shows that it was propelled by a combination of falling pupil–teacher ratios, increasing real wages to teachers, and rising expenditures outside of the classroom. While the expansion of education for the handicapped has had a disproportionate effect on spending, most of the growth in expenditures during the 1980s came from other sources. Increases in teacher salaries, which reflect competitive pressures, particularly for females, nevertheless have failed to keep up with wages in other occupations; this leads to likely declines in teacher quality over time. Moreover, the magnitude of the wage decline is larger than commonly thought because the relative aging of teachers has masked the sizable declines in teacher salaries as compared to salaries of comparably aged people in other occupations.

Aggregation and the Estimated Effects of School Resources

Eric A. Hanushek, Steven G. Rivkin, and Lori L. Taylor

NBER Working Paper No. 5548

April 1996

JEL Nos. I2, H7

Labor Studies

This paper attempts to reconcile the contradictory findings in the debate over school resources and school effectiveness by highlighting the role of aggregation in the presence of omitted variables bias. While data aggregation for well-specified linear models yields unbiased

parameter estimates, aggregation alters the magnitude of any omitted variables bias. In general, the theoretical impact of aggregation is ambiguous. In a very relevant special case in which omitted variables relate to state differences in school policy, however, aggregation implies clear upward bias of estimated school resource effects. Analysis of "High School and Beyond" data provides strong evidence that aggregation inflates the coefficients on school resources. Moreover, the pattern of results is not consistent with an errors-in-variables explanation, the alternative explanation for the larger estimated impact with aggregate estimates. Since studies using aggregate data are much more likely to find positive school resource effects on achievement, these results further support the view that additional expenditures alone are unlikely to improve student outcomes.

Trade Liberalization and Endogenous Growth: A q -Theory Approach

Richard E. Baldwin and Rikard Forslid

NBER Working Paper No. 5549

April 1996

JEL Nos. F12, O40

International Trade and Investment

This paper has two purposes. It introduces a direct approach to policy analysis in endogenous growth models—the q -theory approach—and it uses this approach to illustrate several new links between openness and growth that appear when we enrich the economic content of the early trade and growth models. The approach, inspired by Tobin's q , is merely a change of state variables and a re-interpretation of steady-state conditions. The main difference is its focus on investment, which is after

all the heart of growth models. The simplicity of the approach permits us to expand the early models in interesting directions and to include trade barriers explicitly. Thus we can study incremental policy reform, rather than mere shifts from autarky to free trade (or small deviations from free trade), as in the early literature.

Do Budget Rules Work?

James M. Poterba

NBER Working Paper No. 5550

April 1996

JEL Nos. H61, E62, H62

Public Economics

The design of budget rules and institutions, long a neglected area in public finance and macroeconomics recently has been thrust to center stage by the debate over a balanced budget amendment and other deficit-reduction measures in the United States. This paper describes the existing evidence on how budget rules affect fiscal policy outcomes. It contrasts the "institutional irrelevance view," which holds that budget rules can be circumvented by modifying accounting practices and changing the nominal timing or other classification of taxes and expenditures, with the "public choice view" in which fiscal institutions represent important constraints on the behavior of political actors. Several distinct strands of empirical evidence—from the U.S. federal experience with antideficit rules, the U.S. state experience with balanced budget rules, and international comparisons of budget outcomes in nations with different fiscal institutions—suggest that fiscal institutions *do matter*. Thus the institutional irrelevance view does not hold. However, the existing evidence is not refined enough to provide detailed advice on how nar-

rowly defined changes in budget rules might affect policy outcomes.

The Entry and Exit of Workers and the Growth of Employment: An Analysis of French Establishments

John M. Abowd, Patrick Corbel, and Francis Kramarz

NBER Working Paper No. 5551

April 1996

JEL Nos. J23, J60, D24

Labor Studies

Our empirical analyses distinguish between directly measured flows of workers and directly measured job creation and destruction. Using a representative sample of all French establishments for 1987 to 1990, we find that: 1) annual job creation can be characterized as hiring three persons and separating two for each job created in a given year; 2) annual job destruction can be characterized as hiring one person and separating two for each job destroyed in a given year; 3) two-thirds of all hiring is short-term contracts, and more than half of all separations are attributable to reaching the end of these short-term contracts; 4) when an establishment is shrinking, the adjustment is made by reducing entry (short and long contracts, and transfers) and not by changing the separation rates; 5) for the highest skill groups, 10 percent of months with firm-initiated exits also have new hiring in the same skill group, and for the lowest skill groups, 25 percent of the months with firm-initiated separations also have new hiring in that skill group; 6) approximately one-third of all short-term employment contracts are converted to long-term contracts at their termination; 7) most worker flows are procyclical; 8) employment adjustment occurs primarily

through changes in the entry rates (often of short-term contract workers), and not through the exit rates (except for quits); and 9) the rate of internal promotion into higher-skilled positions is about three times that of net employment changes inside the job category.

Why Do Countries Seek Regional Trade Agreements?

John Whalley

NBER Working Paper No. 5552

April 1996

International Trade and Investment

This paper emphasizes the range of factors that influence country decisions to seek regional trading arrangements. These include conventional access benefits, but extend to safe haven concerns, the use of trade arrangements to underpin security arrangements, and the tactical interplay between multilateral and regional trade negotiating positions. In a final section, we use the results of an earlier modeling effort by Perroni and Whalley to emphasize that nontraditional objectives may be quantitatively more important than traditionally analyzed objectives.

The Comovements Between Real Activity and Prices at Different Business Cycle Frequencies

Wouter J. den Haan

NBER Working Paper No. 5553

April 1996

JEL Nos. E32, C82

Economic Fluctuations and Growth

In this paper, I present two different methods of obtaining a concise set of descriptive results about the comovement of variables. The statistics are easy to interpret and capture important information

about the dynamics in the system that would be lost if one focused only on the unconditional correlation coefficient of detrended data. The methods do not require assumptions about the order of integration. That is, the methods can be used for stationary as well as integrated processes. They do not require the types of assumptions needed for vector autoregression decompositions either. Both methods yield similar results. In the postwar period, the comovement between output and prices is positive in the "short run" and negative in the "long run." During the same period, the comovement between hours and real wages is negative in the "short run" and positive in the "long run." I show that a model in which demand shocks dominate in the short run and supply shocks dominate in the long run can explain the empirical results, while standard sticky-price models with only demand shocks cannot.

A Survey of Corporate Governance

Andrei Shleifer and Robert W. Vishny

NBER Working Paper No. 5554
April 1996
Corporate Finance

This paper surveys the research on corporate governance, with special attention to the importance of legal protection of investors, and to ownership concentration in corporate governance systems around the world.

Drug Use and AFDC Participation: Is There a Connection?

Robert Kaestner

NBER Working Paper No. 5555
April 1996
JEL Nos. I38, I18
Health Economics

Drug use and welfare are two serious social problems that have received widespread public attention. Recently, it has been suggested that illicit drug use is a major cause of welfare, although there is only anecdotal evidence to support such a claim. This paper provides the first systematic analysis of the issue by examining the relationship between illicit drug use and welfare participation among a nationally representative sample of young adults. The results indicate that drug use in the past year, predominantly marijuana use, is related positively to future welfare participation for all women. The magnitude of the drug effect, however, is modest: if drug use among welfare participants was reduced to the levels of nonparticipants, welfare participation would decline by approximately 1 percent.

Budget Deficits and Budget Institutions

Alberto Alesina and Roberto Perotti

NBER Working Paper No. 5556
May 1996
Monetary Economics

By discussing the available theoretical and empirical literature, this paper argues that budget procedures and budget institutions *do* influence budget outcomes. Budget institutions include both procedural rules and balanced budget laws. We critically assess theoretical contributions in this area and suggest several open and unresolved issues. We also examine the empirical evidence drawn from studies on samples of OECD countries, Latin American countries, and U.S. states.

Institutions for Monetary Stability **Christina D. Romer and David H. Romer**

NBER Working Paper No. 5557
May 1996
JEL Nos. E52, E58
Monetary Economics

This paper demonstrates that failures in monetary policy arise not just from dynamic inconsistency, but more importantly, from an imperfect understanding of the economy and the effects of policy. Using recent and historic episodes from the United States and abroad, we show that limited knowledge on the part of economists, policymakers, elected leaders, and voters has been an important source of mistakes in monetary policy. We then analyze what institutions of monetary policy could address the problems of both dynamic inconsistency and limited knowledge. One set of institutions that could do this is a highly independent central bank with discretion about both the goals and the conduct of policy, combined with a two-level structure through which elected leaders appoint a board of trustees for the central bank, which in turn selects the actual policymakers. We conclude by discussing recent and proposed reforms in monetary policy and institutions in industrialized countries in light of this analysis.

Optimal Tax and Debt Policy with Endogenously Imperfect Creditworthiness

Joshua Aizenman, Michael Gavin, and Ricardo Hausmann

NBER Working Paper No. 5558
May 1996
JEL Nos. F15, F21, F34
International Trade and Investment

This paper shows that the patterns of optimal tax rates and borrowing in the presence of constraints on endogenous borrowing differ considerably from the patterns observed with fully integrated capital markets. We study a developing country characterized by costly tax collection. Its access to the international credit market is determined by the efficiency of the tax system, and by the relative bargaining power of creditors. Partial defaults induce a "burden shifting" from bad to good states of nature, reducing the cost of borrowing, and implying that a switch from no-default to a partial-default regime is associated with a borrowing boom. The switch to a partial-default regime also is associated with financial fragility, such that small adverse changes in fundamentals lead to a large accumulation of debt. The tax rate exhibits strong countercyclical patterns in economies operating at the credit ceiling, versus strong procyclical patterns in economies operating on the upward sloping portion of the supply of credit (where the risk premium is positive) and very little cyclical pattern at all in economies operating on the elastic portion of the supply of credit. We identify a volatility-debt curve for a given realization of output. With low debt, higher volatility tends to reduce borrowing. When volatility reaches a threshold, we observe a switch from a no-default to a partial-default regime, where a further rise in volatility increases borrowing and reduces present taxes.

Axiomatic and Economic Approaches to International Comparisons
W. Erwin Diewert

NBER Working Paper No. 5559
 May 1996

JEL Nos. C43, C81, E31, F31
 International Trade and Investment,
 Productivity

This paper considers the problem of choosing a multilateral system of index numbers in order to compare aggregate prices and quantities among many countries and regions. The problems involved in choosing functional forms in order to make these comparisons are both theoretically and empirically more difficult than those involved in choosing a bilateral index number formula. The great variation in relative prices and quantities in the international context means that the choice of a multilateral method is empirically important: different methods will yield very different answers. This paper reviews ten classes of multilateral methods from the viewpoint of both the axiomatic and the economic approach. A new system of 11 desirable axioms or properties for multilateral systems is suggested. With respect to the economic approach, the concept of a superlative bilateral index number formula (which can model substitution effects adequately) is adapted to the multilateral context. Each of the ten classes of multilateral methods is evaluated from the axiomatic and economic perspectives. Four classes of methods are identified as being "best." They are all superlative and satisfy slightly different sets of axioms.

Asian Demography and Foreign Capital Dependence

Matthew Higgins and Jeffrey G. Williamson

NBER Working Paper No. 5560
 May 1996

Development of the American Economy,
 International Trade and Investment

Ansley Coale and Edgar Hoover

were right about Asia. Rising fertility and declining infant mortality have had a profound impact on Asian savings, investment, and foreign capital dependency since Coale and Hoover wrote in 1958. We argue that: 1) Much of the impressive rise in Asian savings rates since the 1960s can be explained by the equally impressive decline in youth dependency burdens. 2) Where Asia has kicked the foreign capital dependence habit is where youth dependency burdens have fallen most dramatically. 3) Aging will not diminish Japan's capacity to export capital in the next century, but little capital will go to the rest of Asia, which will become a net capital exporter, at least if demography is allowed to have its way. These conclusions emerge from a model that rejects steady-state analysis in favor of transition analysis, and extends the conventional focus of the dependency rate literature on savings to investment and net capital flows.

Airline Hubs: Costs, Markups, and the Implications of Customer Heterogeneity
Steven Berry, Michael Carnall, and Pablo T. Spiller

NBER Working Paper No. 5561
 May 1996

JEL Nos. L11, L13, L93
 Industrial Organization

We estimate a model of airline competition that captures the two major features of the industry: product differentiation and economies of density. The results not only provide support for some of the traditional common wisdom in the industry, but also are useful for understanding major puzzles concerning the evolution of the industry. Our estimates indicate that a hubbing airline's ability to raise pri-

ces is focused on tickets that appeal to price-inelastic business travelers, who favor the origin-hub airline, even while paying an average premium of 20 percent. However, these high prices do not provide a "monopoly umbrella" to other non-hub airlines. Finally, on the cost side there is evidence of economies of density (and therefore cost economies of hubbing) on longer routes. Consistent with the "Southwest Airlines" effect, there is no evidence of economies of density on shorter routes.

Information Technology and the Future of Cities

**Jess Gaspar and
Edward L. Glaeser**

NBER Working Paper No. 5562

May 1996

JEL Nos. R11, O18

Economic Fluctuations and Growth

Will improvements in information technology eliminate face-to-face interactions and make cities obsolete? In this paper, we present a model in which individuals make contacts and choose whether to use electronic or face-to-face meetings in their interactions. Cities are modeled as a means of reducing the fixed travel costs involved in face-to-face interactions. When telecommunications technology improves, there are two opposing effects on cities and face-to-face interactions: some relationships that used to be face-to-face will be done electronically (an intuitive substitution effect); and some individuals will choose to make more contacts, many of which result in face-to-face interactions. Our empirical work suggests that telecommunications may be a complement, or at least not a strong substitute for cities and face-to-face interactions. We also present simple models of learning in person, from

a written source, or over the phone. We find that interactive communication dominates other forms of learning when ideas are complicated.

The Mexican Peso Crisis: Sudden Death or Death Foretold?

**Jeffrey D. Sachs, Aaron Tornell,
and Andrés Velasco**

NBER Working Paper No. 5563

May 1996

JEL Nos. E52, E58, F31

International Finance and
Macroeconomics

We argue that allowing for the possibility of a self-fulfilling panic helps in understanding several features of the recent Mexican crisis. Self-fulfilling expectations became decisive in generating a panic only after the government ran down gross reserves and ran up short-term dollar debt. We present a simple model to explain how and why multiple equilibriums can occur for some levels of reserves or debt, but not for others. Finally, we argue that the imperfect credibility of Mexican exchange rate policy made it advisable to follow more contractionary fiscal and monetary policies in 1994. Our model formalizes the reasons for this.

Parametric and Nonparametric Approaches to Price and Tax Reform

Angus Deaton and Serena Ng

NBER Working Paper No. 5564

May 1996

JEL Nos. H2, C4

Public Economics

In the analysis of tax reform, when equity is traded off against efficiency, measuring efficiency requires knowing how tax-induced price changes affect quantities supplied and demanded. In this paper,

we present various econometric procedures for estimating how taxes affect demand. We examine the advantages and disadvantages of parametric methods of tax reform analysis, and suggest that the non-parametric "average derivative estimator" is a useful alternative. We apply both parametric and non-parametric methods to analyzing possible price reform for foods in rural Pakistan, and discuss the issues that remain to be dealt with in empirical welfare analyses.

The Role of History in Bilateral Trade Flows

**Barry Eichengreen and
Douglas A. Irwin**

NBER Working Paper No. 5565

May 1996

International Trade and Investment

This paper investigates the theory and evidence for history playing a role in shaping the direction of international trade. Because there are reasons to anticipate a positive correlation between the predominant direction of trade flows in the past and membership in preferential arrangements in the present, there may be a tendency to attribute spuriously to preferential arrangements the effects of historical factors and to exaggerate the influence of the former. Thus, the standard gravity-model formulation, which neglects the role of historical factors, suffers from omitted-variables bias. We illustrate these points by analyzing the evolution of trade between 1949 and 1964. We find that historical factors exercise an important influence on trade even after we control for the arguments of the standard gravity model.

How Much Does Sorting Increase Inequality?

Michael Kremer

NBER Working Paper No. 5566

May 1996

JEL Nos. D31, D91

Economic Fluctuations and Growth

Social commentators from William Julius Wilson to Charles Murray have argued that increased sorting of people into internally homogeneous neighborhoods, schools, and marriages is spurring long-run inequality. Calibration of a formal model suggests that these fears are misplaced. In order to increase the steady-state standard deviation of education by 1 percent, the correlation between neighbors' education would have to double, or the correlation between spouses' education would have to increase by one third. In fact, both correlations have declined slightly over the past few decades. Sorting has somewhat more significant effects on intergenerational mobility than on inequality.

Do Workplace Smoking Bans Reduce Smoking?

William N. Evans,
Matthew C. Farrelly, and
Edward Montgomery

NBER Working Paper No. 5567

May 1996

JEL Nos. J28, I18

Health Economics, Labor Studies

In recent years there has been a heightened public concern over the potentially harmful effects of environmental tobacco smoke. In response, smoking has been banned on many jobs. Using data from the 1991 and 1993 National Health Interview Surveys and smoking supplements to the September 1992 and May 1993 Current Population Surveys, we investigate whether these workplace policies reduce the prevalence and intensity of

smoking among workers. Our estimates suggest that workplace bans reduce the prevalence of smoking by 5 percentage points, and reduce average daily consumption among smokers by 10 percent. The impact of the bans is greatest for those with long work weeks. Although workers with better health habits are more likely to work at establishments with workplace smoking bans, estimates from bivariate probit and two-stage least squares equations suggest that there is no omitted variables bias. The rapid increase in workplace bans can explain all of the recent sharp fall in smoking among workers relative to nonworkers.

Abandoning the Nest Egg? 401(k) Plans and Inadequate Pension Saving

Andrew A. Samwick and
Jonathan Skinner

NBER Working Paper No. 5568

May 1996

JEL Nos. J32, D31

Aging, Public Economics

"Self-directed" pension programs, such as the 401(k) plan, have been growing rapidly. Because such plans are voluntary, there is concern that many workers who neglect to contribute will reach retirement without adequate pension saving. We show first that people who are eligible for 401(k)s but do not contribute to them and have no alternative pension plan make up only 2-4 percent of the work force. By contrast, nearly 50 percent of workers have no pension coverage at all. Imposing mandatory 3 percent or 5 percent contribution rates will improve retirement prospects among the lowest decile of pension-eligible, but would have small aggregate effects. Finally, restricting 401(k) withdrawals when the worker changes

jobs could have a larger impact on retirement pension security.

Quality Change in Capital Goods and Its Impact on Economic Growth

Charles R. Hulten

NBER Working Paper No. 5569

May 1996

Productivity

This paper argues that productivity puzzles, such as the Solow Paradox, arise in part from the omission of an important dimension of the debate: the resource cost of achieving a given rate of technical change. I propose a remedy in which a new parameter, defined as the *cost elasticity of producing capital with respect to the rate of technical change*, is introduced. This parameter is latent in the Hall-Jorgenson user cost of capital, as well as in the Solow residual. I also show that an increase in the rate of embodied technical change actually may cause a *decrease* in the Solow residual, in the short run, if the parameter is greater than the ratio of the user cost to the corresponding asset price.

Different values of the new parameter also correspond to different theories of technological innovation: the Solow-Swan and Cass-Koopmans assumption of costless technical change is consistent with a zero value of the cost elasticity parameter, while the model of endogenous growth with R and D externalities implies a larger value. Finally, the appropriate investment-good price deflator is shown to be a function of the cost elasticity. When the parameter equals zero, no quality adjustment should be undertaken. Values greater than zero lead to a partial adjustment for quality change, and a value of one leads to a full correction.

Are Recessions Good for Your Health?

Christopher J. Ruhm

NBER Working Paper No. 5570

May 1996

JEL No. I12

Economic Fluctuations and Growth,
Health Economics

This study examines the relationship between economic conditions and health, using fixed-effect models and state level data for 1972–91. Health is proxied by total and age-specific mortality rates, as well as by ten particular causes of death. Total mortality and nine of the ten sources of fatalities both vary procyclically, with suicides representing the important exception. The fluctuations in mortality are larger for 20–44-year-olds than for older individuals. The predicted relationship between personal incomes and health is quite weak, and is sensitive to the model specification, the time period, and dependent variables. These findings suggest the possible importance of cyclical variations in the time costs of medical care or healthy lifestyles, and of negative health effects of jobholding.

Understanding the Postwar Decline in U.S. Saving: A Cohort Analysis

**Jagadeesh Gokhale,
Laurence J. Kotlikoff, and
John Sabelhaus**

NBER Working Paper No. 5571

May 1996

JEL No. E21

Aging, Economic Fluctuations and
Growth, Public Economics

Since 1980, the U.S. net national saving rate has averaged less than half what it was in the 1950s and 1960s. This paper develops a unique cohort dataset to study the decline

in U.S. national saving. It decomposes postwar changes in U.S. saving into those attributable to changes in: cohort-specific consumption propensities; the intergenerational distribution of resources; government spending on goods and services; and demographics.

We find that the decline in U.S. saving can be traced to two factors: the redistribution of resources from young and unborn generations, with low or zero propensities to consume, toward older generations with high consumption propensities; and, a significant increase in the consumption propensities of older Americans. Most of the redistribution to the elderly reflects the growth in Social Security, Medicare, and Medicaid benefits. The increase in the elderly's consumption propensities also may reflect government policy, namely the fact that Social Security, Medicare, and Medicaid benefits are paid in the form of annuities and that, in the case of Medicare and Medicaid, the annuities are in-kind, and therefore must be consumed.

Large Cash Transfers to the Elderly in South Africa

**Anne C. Case and
Angus S. Deaton**

NBER Working Paper No. 5572

May 1996

JEL Nos. H3, J1

Aging, Public Economics

We examine the social pension in South Africa, where large cash sums—about twice the median per capita income of African households—are paid to people qualified by age, irrespective of previous contributions. We present the history of the scheme and use a 1993 nationally representative survey to investigate the redistributive consequences of the transfers, documenting who receives the pen-

sions, their levels of living, and those of their families. We also look at behavioral effects, particularly the effects of the cash receipts on the allocation of income to food, schooling, transfers, and savings. Two methodological issues run through our analysis. The first is the danger of interpreting simple correlations and regressions without adequate consideration of likely biases. The second is the problem of measuring the effects of a program that is determined by individual or household characteristics. We examine both in the context of the South African pension. Our results are consistent with the view that pension income is spent in much the same way as other income, and that "a rand is a rand," regardless of its source.

Debt and Monetary Policy: The Policy Issues

Rudi Dornbusch

NBER Working Paper No. 5573

May 1996

JEL Nos. E5, E6

International Finance and
Macroeconomics, Monetary Economics

This paper explores the implications of high debt for monetary policy. In Europe, debt (and deficits) play a special role in the run up to Maastricht, because large debts are seen as a threat to the integrity of the new European money. The paper reviews two historical episodes: the German, U.K., and French experience in the 1920s; and the U.S. debt liquidation of 1950–80. The theoretical review focuses on hypotheses of Keynes, Clark, and Sargent–Wallace. The paper adds private balance sheet vulnerability to the range of concerns.

Strategic Export Subsidies and Reciprocal Trade Agreements: The Natural Monopoly Case

Kyle Bagwell and Robert W. Staiger

NBER Working Paper No. 5574

May 1996

JEL Nos. F12, F13

International Trade and Investment

Why do governments seek to restrict the use of export subsidies through reciprocal trade agreements, such as GATT? With existing arguments, it is possible to understand GATT's restrictions on export subsidies as representing an inefficient victory of the interests of exporting governments over the interests of importing governments. However, to our knowledge, there does not exist a formal theoretical treatment that provides circumstances under which GATT's restrictions on export subsidies can be given a worldwide efficiency rationale. In this paper, we offer one such treatment in the context of a natural monopoly market. We emphasize that subsidy competition between governments can serve to *coordinate* the entry decisions of firms, finding that consumers in the importing countries may suffer if the coordination afforded exporters by government subsidy programs does more to *prevent* entry than to *promote* it. In such circumstances, we show that the existence of export subsidy programs can lead to inefficiencies, and that importing countries and the world as a whole can be better off when such programs are banned.

Inflation and the Growth Rate of Output

Christina D. Romer

NBER Working Paper No. 5575

May 1996

JEL No. E31

Economic Fluctuations and Growth,
Monetary Economics

This paper shows that inflation has depended strongly on the growth rate of output for most of the twentieth century. Only in recent years has the deviation of output from trend become the predominant determinant of price behavior. The paper also shows that the growth rate effect works primarily through materials prices, and that the declining importance of materials can explain why the growth rate effect has weakened over time. Finally, the paper shows that the growth rate effect can explain why prices rose in the mid- and late 1930s despite the fact that output was substantially below trend.

Financial Crises in Emerging Markets: The Lessons from 1995

Jeffrey D. Sachs, Aaron Tornell, and Andrés Velasco

NBER Working Paper No. 5576

May 1996

International Finance and
Macroeconomics

In this paper, we examine the financial events following the devaluation of the Mexican peso to uncover new lessons about the nature of financial crises. We explore the question of why some emerging markets were hit by financial crises during 1995, while others were not. To this end, we ask whether there are some *fundamentals* that help explain the variation in financial crises across countries, or whether the variation just reflects *contagion*. We present a simple model identifying three factors that determine whether a country is more vulnerable to a financial crisis: a high real exchange rate appreciation; a recent lending boom; and low reserves. We find that for a set of 20

emerging markets, differences in these fundamentals go far in explaining why certain emerging markets were hit by financial crises during 1995. We also find that alternative hypotheses that have been put forth to explain such crises, including high current account deficits, excessive capital inflows, and loose fiscal policies, do not seem to be supported by the data.

Costly Information in Firm Transformation, Exit, or Persistent Failure

Lynne G. Zucker and Michael R. Darby

NBER Working Paper No. 5577

May 1996

JEL No. O33

Productivity

Firms invest differentially in the intellectual human capital required to recognize, evaluate, and utilize technological breakthroughs occurring outside the firm. Such differential investment has been crucial in explaining which incumbent pharmaceutical firms have transformed their technological identities successfully in response to the biotechnological revolution, and which are threatened by persistent low performance. While all incumbent firms lagged the dedicated new biotechnology firms in adopting the new drug-discovery technology, firms with higher R and D expenditures before the biotech revolution were more likely to adopt the new techniques successfully, and were likely to do so earlier. Firms failing to adopt the new techniques had lower performance than firms adopting more fully and faster.

Multilevel "General Policy Equilibria": Evidence from the American Unemployment Insurance Tax Ceiling

Daniel S. Hamermesh and David Scoones

NBER Working Paper No. 5578
May 1996
Labor Studies

In a large variety of multilevel political systems, changes imposed by a higher authority alter the equilibrium panoply of lower-level policies. The new equilibrium depends on the type of change imposed, and on the relative strengths of and differences among interested parties at the lower level. As an example, we describe how the equilibrium parameters of American states' unemployment insurance (UI) systems are changed when, to finance UI benefits, the federal government raises the minimum annual earnings on which employers are taxed. Even though benefits determine total taxes at a point in time within state systems, bargaining among the interested parties alters the equilibrium level of benefits and taxes. We estimate a "difference-in-differences" model describing total system costs in those states where federal increases in 1972, 1978, and 1983 forced increases in the tax ceiling. Holding constant changes in interstate differences in unemployment, costs rose roughly 20 percent above where they would have been where the federal constraint was binding. The increase was larger in those states where unionism, a measure of workers' legislative power, was greater. The theoretical model and the implied empirical analysis suggest themselves as examples for future research on a variety of topics in labor economics, public finance, and international trade.

Inflation Targeting in Canada, New Zealand, Sweden, the United Kingdom, and in General

Bennett T. McCallum

NBER Working Paper No. 5579
May 1996
JEL Nos. E52, E58
Economic Fluctuations and Growth,
Monetary Economics

This paper begins with a description of the inflation targeting arrangements currently in place in the four abovementioned countries and reviews their performance records through mid-1995. I argue, however, that too little time has passed for conclusions to be drawn, so that tentative evaluations of inflation targeting need to be based on theoretical analysis and more generalized historical experiences. Accordingly, I consider two alternative rationalizations, one stemming from the literature on dynamic inconsistency and the other based on more pragmatic considerations. In addition, I ask whether some other nominal magnitude might be preferable as a target variable, and address the issue of growth-rate versus growing-level target paths.

Sex-Based Differences in School Content and the Male/Female Wage Gap

Charles Brown and Mary Corcoran

NBER Working Paper No. 5580
May 1996
JEL No. J16
Labor Studies

In high school and in college, men and women take significantly different courses. Using data from the Survey of Income and Program Participation and the National Longitudinal Study Class of 1972, we relate these differences in school

content to sex differences in adult wages.

Differences in field of highest degree account for a significant part of the male-female wage gap among college graduates, but differences in coursework account for very little of the equally large wage gap between men and women with less schooling. We find little consistent evidence that men receive larger rewards for taking traditionally male rather than traditionally female courses and majors, although there is some indication of this for college graduates.

How the Bundesbank Conducts Monetary Policy

Richard H. Clarida and Mark Gertler

NBER Working Paper No. 5581
May 1996
JEL No. E5
International Finance and
Macroeconomics, Monetary Economics

This paper analyzes German monetary policy in the post-Bretton Woods era. Despite the public focus on monetary targeting, in practice in Germany as in the United States monetary policy involves the management of short-term interest rates. Except during the mid- to late 1970s, the Bundesbank has adjusted interest rates aggressively to achieve and maintain low inflation. The performance of the real economy, however, also influences the Bundesbank's decisionmaking. Our formal analysis suggests that the Bundesbank has adjusted short-term interest rates according to a modified version of the feedback rule that Taylor (1994) has used to characterize the behavior of the Federal Reserve Board under Alan Greenspan.

Trade-Induced, Investment-Led Growth

**Richard E. Baldwin and
Elena Seghezze**

NBER Working Paper No. 5582

May 1996

JEL Nos. F43, F12

International Trade and Investment,
International Finance and
Macroeconomics

This paper presents five theoretical openness-and-growth links that can account for trade-induced, investment-led growth. We demonstrate the links with neoclassical growth models developed in the context of trade models that allow for imperfect competition and scale economies. This sort of old-growth-theory-in-a-new-trade-model has not been explored thoroughly in the literature since the profession skipped from old-growth-old-trade models straight to new-growth-new-trade models. Nonetheless, such models are necessary to explain several key aspects of the econometric evidence on trade and growth. For example, cross-country data suggest that openness influences growth only via its effect on investment, and suggest that openness promotes investment in all countries whatever the capital-intensive of their exports (contrary to predictions of the old-growth-old-trade models).

Unequal Societies

Roland Bénabou

NBER Working Paper No. 5583

May 1996

JEL Nos. D31, E62, P16, O41

Economic Fluctuations and Growth

This paper aims to explain the significant variations in the social contract observed across nations. It shows how countries with similar technologies and preferences, as well as equally democratic political

systems, can sustain very different average and marginal tax rates. Similarly, it provides an explanation for the striking difference between the U.S. and European systems of education finance or health insurance. The underlying mechanism operates as follows: With imperfect credit and insurance markets, some redistributive policies can have a *positive* effect on aggregate output, growth, or more generally on ex ante welfare. The examples I consider include social insurance, progressive taxation combined with investment subsidies, and public education. Aggregate efficiency gains imply very different consequences for political economy from those of standard models: the extent of political support for such redistributive policies *decreases* with the degree of inequality, at least over some range. This can generate a negative correlation between inequality and growth, as found in the data, without the usual feature that transfers increase with inequality, which is not supported empirically. Moreover, imperfections in the capital market make future earning a function of current resources. Combined with the politics of redistribution, this creates the potential for *multiple steady states*, with mutually reinforcing high inequality and low redistribution, or vice-versa. Temporary shocks to the distribution of income or the political system then can have permanent effects.

Corporate Ownership Structures: Private Versus Social Optimality

**Lucian Arye Bebchuk and
Luigi Zingales**

NBER Working Paper No. 5584

May 1996

Corporate Finance, Law and Economics

This paper analyzes the ineffi-

ciencies that might arise in the ownership structure chosen at the initial public offering stage. We show that, contrary to what is commonly believed, the desire of initial owners to maximize their proceeds leads them to choices that, although privately optimal, may be socially inefficient. This distortion tends to be in the direction of excessive incidence of controlling shareholder structures and excessive divestment of cash flow rights. Our analysis has far-reaching policy implications for dual class stock, stock pyramiding, sale of control rules, and public offerings of minority shares. Among its positive implications, our analysis suggests reasons for the substantial differences in the incidence of control blocks across different countries.

The Dynamics of Franchise Contracting: Evidence from Panel Data

**Francine Lafontaine and
Kathryn L. Shaw**

NBER Working Paper No. 5585

May 1996

JEL Nos. L14, L80

Industrial Organization

In this paper, we model the determinants of franchise contract terms, namely royalty rates and franchise fees, using a unique panel dataset of about 1000 franchisors for 1980-92. We focus on the extent to which firms adjust the terms of their contracts as they become better established, and find that adjustment is relatively infrequent and that firms do not raise or lower their royalty rates or franchise fees systematically when they do adjust them. These results tend to refute a number of existing theories of franchising that are based on risksharing, asymmetric information, and certain incentive structures, but support those based on franchisor

opportunism and to some extent double-sided moral hazard. Our results also suggest that when industrial organization economists do not have access to panel data, their work well may suffer from the omitted variable bias caused by unobserved firm effects.

Budget Institutions and Fiscal Performance in Latin America

**Alberto Alesina,
Ricardo Hausmann,
Rudolf Hommes, and
Ernesto Stein**

NBER Working Paper No. 5586
May 1996
Public Economics, Monetary
Economics

In this paper we collect detailed information on the budget institutions of Latin American countries. We classify these institutions on a "hierarchical/collegial" scale, as a function of their transparency and the existence of legislative constraints on the deficit. We then show that "hierarchical" and transparent procedures have been associated with more fiscal discipline in Latin America in the 1980s and early 1990s.

A Scorecard for Indexed Government Debt

**John Y. Campbell and
Robert J. Shiller**

NBER Working Paper No. 5587
May 1996
JEL Nos. G12, E44
Asset Pricing, Economic Fluctuations
and Growth, Monetary Economics

Within the last five years, Canada, Sweden, and New Zealand have joined the ranks of the United Kingdom and other countries in issuing government bonds that are indexed to inflation. Some observers of the experience in these coun-

tries have argued that the United States should follow suit. This paper provides an overview of the issues surrounding debt indexation, and it tries to answer three empirical questions about indexed debt. First, how different would the returns on indexed bonds be from the returns on existing U.S. debt instruments? Second, how would indexed bonds affect the government's average financing costs? Third, how might the Federal Reserve be able to use the information contained in the prices of indexed bonds to help formulate monetary policy? The paper concludes with a more speculative discussion of the possible consequences of increased use of indexed debt contracts by the private sector.

Investor Reaction to Salient News in Closed-End Country Funds

**Peter Klibanoff,
Owen Lamont, and
Thierry A. Wizman**

NBER Working Paper No. 5588
May 1996
JEL No. G12
Asset Pricing

We provide a model of closed-end fund pricing that includes investors who do not form expectations correctly and allows for salient country-specific news to affect this process of expectation formation. We use panel data on prices and net asset values of closed-end country funds to examine investor reaction to news that affects fundamentals, and to measure the response of the idiosyncratic change in fund prices to the idiosyncratic change in fund asset values. In a typical week, U.S. prices underreact to changes in foreign fundamentals: the (short-run) elasticity of price with respect to asset value is significantly less than one. In weeks

with major news (relevant to the specific country) appearing on the front page of the *New York Times*, prices react much more to fundamentals: the elasticity of price with respect to asset value is closer to one. These results are roughly consistent with the hypothesis that major news events lead some investors who normally lag behind in updating their expectations to temporarily react more quickly.

Tax Policy and the Activities of Multinational Corporations

James R. Hines, Jr.

NBER Working Paper No. 5589
May 1996
JEL Nos. H87, H25, F23
International Trade and Investment,
Public Economics

This paper reviews quantitative studies of the impact of international tax rules on the financial and real behavior of multinational firms. The evidence, much of it recent, indicates that taxation significantly influences foreign direct investment, corporate borrowing, transfer pricing, dividend and royalty payments, R and D activity, exports, bribe payments, and location choices. While taxes appear to influence a wide range of activity, the literature does not offer many subtle tests designed to distinguish different theories of the effects of taxation on multinational firms. The paper evaluates the reliability of existing evidence and its implications for the design of international tax policy.

Mismeasurement in the Consumer Price Index: An Evaluation

**Matthew D. Shapiro and
David W. Wilcox**

NBER Working Paper No. 5590
May 1996

JEL Nos. C82, E31
Economic Fluctuations and Growth,
Monetary Economics, Productivity

A number of analysts recently have claimed that the Consumer Price Index (CPI) overstates the annual increase in the cost of living. This paper develops a framework for studying measurement problems in the CPI and systematically analyzes the available evidence concerning the magnitude of these problems. It concludes that the CPI does overstate increases in the cost of living.

The evidence suggests that the bias is centered on 1 percentage point per year. The extent of this bias is not known exactly. To take into account this uncertainty, we present the estimated bias in terms of a probability distribution rather than a point estimate or range. We estimate that there is a 10 percent chance that the bias is less than 0.6 percentage points and a 10 percent chance that it is greater than 1.5 percentage points per year.

CPI procedures overstate the rate of inflation for medical procedures that are subject to technological improvement. To illustrate this point and to show how better to measure medical care prices, the paper presents a prototypical price index for cataract surgery. This price index grows much more slowly than a price index for cataract surgery constructed using the methodology of the CPI.

We discuss implications of CPI mismeasurement for monetary and fiscal policy as well as for other official statistics. We also offer some suggestions for improving the CPI.

Public Policy for Health Care

David M. Cutler

NBER Working Paper No. 5591
May 1996

JEL Nos. I11, I18
Aging, Health Care, Public Economics

This paper reviews the public sector's role in the provision of health care. One role of the government is to use tax policy to correct externalities associated with individual behaviors. Estimates suggest that the external effects of many "sins," such as alcohol consumption, are greater than current taxes on these goods. A second role of the government is to correct distortions in markets for medical care and health insurance. Markets for health insurance traditionally have not offered a choice between cost and the generosity of benefits. As a result, there have been incentives for excessive technological development, particularly for technologies that increase spending. Once technologies have diffused widely, they are overutilized. Policies to increase choice in insurance markets could increase welfare, provided that they limit segmentation on the basis of risk.

Illegal Immigration, Border Enforcement, and Relative Wages: Evidence from Apprehensions at the U.S.-Mexico Border

Gordon H. Hanson and Antonio Spilimbergo

NBER Working Paper No. 5592

May 1996

JEL No. F22

International Trade and Investment

We examine illegal immigration in the United States from Mexico during 1976-95. One challenge is that we cannot observe the number of individuals who attempt to enter the United States illegally; we can only observe the number of individuals apprehended while attempting to cross the border illegally. Based on a simple migration

model, we postulate the existence of an apprehensions function, which expresses apprehensions at the border as a function of illegal attempts to cross the border and U.S. border-enforcement effort. We estimate a reduced-form apprehensions function using monthly data on apprehensions at the U.S.-Mexico border, person-hours the U.S. Border Patrol spends policing the border, and wages in the United States and Mexico. We find that a 10 percent decrease in the Mexican real wage leads to a 7.5 percent to 8.8 percent increase in apprehensions at the border. Under plausible conditions, this is a lower bound for the effect of the Mexican wage on attempted illegal immigration. It is the purchasing power of U.S. wages in Mexico, not the purchasing power of U.S. wages in the United States, that matters for border apprehensions; this suggests that migrants expect to maintain ties with Mexico. Border apprehensions are higher in the month following a large devaluation of the peso and when the change in the Mexican real wage is negative. Each additional hour that the U.S. Border Patrol spends policing the border yields an additional 0.25 to 0.33 apprehensions.

Implementing Market Access

Kala Krishna, Suddhasatwa Roy, and Marie C. Thursby

NBER Working Paper No. 5593

May 1996

JEL Nos. F12, F13

International Trade and Investment

The outcome of trade policies to increase access for foreign firms to the home country's market is sensitive to the implementation procedure used. We highlight the importance of the timing of moves be-

tween government and firms by focusing on taxes and subsidies to implement minimum market share requirements. Both taxes and subsidies chosen by the home government after firms have picked prices create powerful incentives for firms to raise prices—effects that are similar in nature to those found with quotas/VERs. We show that some degree of imprecision in implementing the target engenders less anticompetitive outcomes relative to perfect enforcement.

Policies for Green Design **Don Fullerton and** **Wenbo Wu**

NBER Working Paper No. 5594
May 1996
JEL Nos. D6, H2, Q2
Public Economics

We analyze alternative policies, including a disposal content fee, a subsidy for recyclable designs, unit pricing of household disposal, a deposit-refund system, and a manufacturer “take-back” requirement. In order to identify the problem being addressed, we build a simple general equilibrium model in which household utility depends on a negative externality from total waste generation, and in which firms use primary and recycled inputs to produce output that has two “attributes”: packaging per unit output, and recyclability. If households pay the social cost of disposal, then they send the right signals to producers to reduce packaging and to design products that can be recycled more easily. But if local governments are constrained to collect household garbage for free, then households do not send the right signals to producers. The socially optimal attributes still can be achieved by a tax on producers’ use of packaging and a subsidy to producers’ use of recyclable designs.

Accounting for Chinese Trade: Some National and Regional Considerations **K. C. Fung**

NBER Working Paper No. 5595
May 1996
International Trade and Investment

China’s trade has three features: a high incidence of reexports through Hong Kong; a high degree of trade related to foreign investment; and a large amount of “illegal” trade. Reexports occur when imports to Hong Kong are consigned to a buyer in Hong Kong, who adds a markup, and exports the goods elsewhere without fundamentally changing them. Using U.S. data and accounting for reexports, I find the U.S.–China trade balance to be 35 percent lower than reported.

Foreign investments in China accounted for 45 percent of China’s exports. These investments include foreign direct investment and foreign subcontracting. Finally, “illegal” trade between China and Taiwan has been induced by Taiwan’s “no direct trade” policy. Illegal trade, including smuggling and tariff evasion, also affects China’s trade with her other trading partners.

The Changing Face of Job Loss in the United States, 1981–93

Henry S. Farber
NBER Working Paper No. 5596
May 1996
JEL No. J63
Labor Studies

I examine changes in the incidence and consequences of job loss by reported cause between 1981 and 1993 using data from Displaced Workers Surveys, conducted as part of the Current Population Survey in even years since 1984. The overall rate of job loss is

up somewhat in the 1990s. The increase in job loss is larger for older and more-educated workers, but younger and less-educated workers continue to have the highest rates of job loss. Some significant changes also are found in the rate of job loss by reported reason.

I then examine the consequences of displacement for several post-displacement labor market outcomes, including the probability of employment, full-time/part-time status, the change in earnings, job stability, and self-employment status. The adverse consequences of job loss, which always have been substantial, do not appear to have changed systematically over time. More-educated workers suffer less economic loss relative to income because of displacement than do the less-educated. Self-employment appears to be an important response to displacement, and older workers and those with more education are more likely to turn to self-employment.

Crucial Issues Concerning Central Bank Independence

Bennett T. McCallum
NBER Working Paper No. 5597
May 1996
JEL Nos. E58, E52
Economic Fluctuations and Growth,
Monetary Economics

First, this paper argues that it is inappropriate to presume that central banks, in the absence of any tangible precommitment technology, inevitably will behave in a “discretionary” fashion that implies an inflationary bias. Furthermore, there is no necessary trade-off between “flexibility and commitment.” Second, to the extent that the absence of any precommitment technology is nevertheless a problem, it will apply to a consolidated central-

bank-plus-government entity as well as to the central bank alone. Thus contracts between governments and central banks do not overcome the motivation for dynamic inconsistency; they merely relocate it. I discuss several implications.

Should Transfer Payments Be Indexed to Local Price Levels?

Edward L. Glaeser

NBER Working Paper No. 5598

May 1996

JEL Nos. H21, R50

Public Economics

This paper examines the optimal location-based redistribution policy and shows that adjustment for local price levels is occasionally optimal, but never for the reasons suggested by the popular press. First, the existence of a spatial equilibrium suggests that utility levels will equalize across space, so there is little equity rationale for indexing transfers to local prices. Second, since transfers to high-cost areas buy less than transfers to low-cost areas, it is in fact less efficient to transfer to high-cost areas. However, even though migration ensures that utilities equalize across space, marginal utilities of income will not necessarily equalize; and, since optimal transfer policy equalizes marginal, but not total, utilities, there may be a rationale for indexing to local price levels. Optimal indexing is a function of the coefficient of relative risk aversion, the elasticity of migration with respect to transfer differences across space, and the degree to which higher amenities in high-cost areas increase or decrease the marginal utility of income. Given my best parameter estimates, a 1 percent increase in local prices should lead to a 0.5 percent increase in transfers, when transfers are two-thirds of total in-

come. My estimates from current AFDC payments suggest that the current level of implicit indexing is too high to possibly be optimal.

Personal Retirement Saving Programs and Asset Accumulation: Reconciling the Evidence

**James M. Poterba,
Steven F. Venti, and
David A. Wise**

NBER Working Paper No. 5599

May 1996

Aging, Public Economics

Over the past several years, we have undertaken a series of analyses of the effect of IRA and 401(k) contributions on net personal saving. We have summarized this research here, together with additional results. Heterogeneity of savers is the key impediment to determining the effect of these plans; we have used different methods to address this issue, and we have organized the discussion according to the method used. We emphasize that no single method can control fully for all forms of heterogeneity. Taken together, however, we believe that the analyses address the key complications presented by heterogeneity. In our view, the evidence, based on the many nonparametric approaches we discuss, strongly supports the view that contributions to both IRA and 401(k) plans largely represent new saving. Some of the evidence is directed to the IRA program, other evidence to the 401(k) plan, and some of the evidence to both plans jointly. We believe that the evidence is strong in all cases.

Several other investigators have used different methods to consider the effect of these retirement saving programs on personal saving and, in some cases, have reached very different conclusions from ours.

Thus we have devoted particular effort to trying to reconcile the results, explaining why different approaches, sometimes based on the same data, have led to different conclusions. In some instances, we believe, the limitations of the methods used by others have undermined the reliability of their results. We devote particular attention to a recent paper by Gale and Scholz (1994) that is cited widely as demonstrating that IRAs have no effect on saving. Based on our analysis of the data used by Gale and Scholz, including calculations based on a replication of their model, we find that their conclusions are inconsistent with the raw data, and that their formal model does not provide reliable information on the extent of substitution.

Understanding Financial Crises: A Developing Country Perspective

Frederic S. Mishkin

NBER Working Paper No. 5600

May 1996

JEL Nos. E0, F4, G2

Economic Fluctuations and Growth,
Monetary Economics

This paper explains how a developing economy can shift dramatically from a path of reasonable growth before a financial crisis, as was the case in Mexico in 1994, to a sharp decline in economic activity after a crisis occurs. I outline an asymmetric information framework for analyzing banking and financial crises in developing countries. This framework shows why the banking sector is so important to the economy, particularly in developing countries, and provides a rationale for bank regulation and supervision. I then use this framework to understand why banking and financial crises occur, and why they can have such a devastating effect

on the economy, particularly in developing countries. I conclude by discussing policy implications for developing countries. One important theme is that an appropriate institutional structure is critical to preventing banking and financial crises in developing countries and to reducing their undesirable effects if they should occur.

The Effect of New Political Administration on Federal Government Productivity and Employment

Frank R. Lichtenberg

NBER Working Paper No. 5601

June 1996

JEL Nos. H5, J23, O4

Productivity

There have been a number of econometric studies of the effect of changes in management and control on the productivity and employment of private, but not of public, enterprises. This paper examines the impact of changes in political administration on the productivity and employment of the entire executive branch of the U.S. government, using data compiled under the Bureau of Labor Statistics' Federal Productivity Measurement Program. The estimates indicate that the mean rate of productivity growth in the first year of administrations is 2.6 times as high as the mean growth in subsequent years. Also, employment growth increases with the administration's tenure: 95 percent of federal employment growth during 1967-94 occurred in the fourth or later years of political administrations, although administrations were that old only 36 percent of the time. These findings are broadly consistent with evidence about the private sector. They suggest that the inauguration of a new administration initially purges the executive

branch, but as an administration's tenure increases, fat and inefficiency tend to accumulate.

Trade Credit: Theories and Evidence

Mitchell A. Petersen and Raghuram G. Rajan

NBER Working Paper No. 5602

June 1996

JEL Nos. G2, G3

Corporate Finance

In addition to borrowing from financial institutions, firms may receive financing from their suppliers. Although there are many theories explaining why nonfinancial firms lend money, few comprehensive empirical tests of these theories exist. This paper attempts to fill the gap.

We focus on a sample of small firms whose access to capital markets may be limited. We find that firms use trade credit relatively more when credit from financial institutions is not available. Thus, while short-term trade credit may be used routinely to minimize transactions costs, medium-term borrowing against trade credit is a form of financing of last resort. Suppliers lend to firms that no one else lends to because it may give them a comparative advantage in cheaply getting information about buyers, a better ability to liquidate goods, and a greater implicit equity stake in the firm's long-term survival. We find some evidence that the use of trade credit is a means of price discrimination. Finally, we find that firms with better access to credit from financial institutions offer more trade credit. This suggests that firms may intermediate between institutional creditors and other firms with limited access to financial institutions.

Are Affirmative Action Hires Less Qualified? Evidence from Employer-Employee Data on New Hires

Harry J. Holzer and David Neumark

NBER Working Paper No. 5603

June 1996

JEL Nos. J15, J16, J24, J38, J78

Labor Studies

We use microlevel data on employers and employees to investigate whether Affirmative Action procedures lead firms to hire minority or female employees who are less qualified than workers who otherwise might be hired. Our measures of qualifications include: the educational attainment of the workers hired (both absolutely and relative to job requirements); skill requirements of the job into which they are hired; and a variety of outcome measures that presumably are related to worker performance on the job. The analysis is based on a representative sample of over 3200 employers in four major U.S. metropolitan areas. Our results show some evidence of lower educational qualifications among blacks and Hispanics hired under Affirmative Action, but not among white women. Further, our results show little evidence of substantially weaker job performance among most groups of minority and female Affirmative Action hires.

Evidence on the Characteristics of Cross-Sectional Variation in Stock Returns

Kent Daniel and Sheridan Titman

NBER Working Paper No. 5604

June 1996

JEL Nos. G11, G12

Corporate Finance

Firm size and book-to-market

ratios both are highly correlated with the returns of common stocks. Fama and French (1993) have argued that the association between these firm characteristics and their stock returns arises because size and book-to-market ratios are proxies for nondiversifiable factor risk. In contrast, we find that the return premiums on small capitalization and high book-to-market stocks do not arise because of the comovements of these stocks with pervasive factors. It is the firm characteristics and not the covariance structure of returns that explain the cross-sectional variation in stock returns.

Why Do Firms Train? Theory and Evidence

Daron Acemoglu and Jörn-Steffen Pischke

NBER Working Paper No. 5605

June 1996

JEL Nos. D82, J24, J42

Labor Studies

This paper offers and tests a theory of training whereby workers do not pay for the general training they receive. The crucial ingredient in our model is that, relative to other firms, the current employer has superior information about the worker's ability. This informational advantage gives the employer ex post monopsony power over the worker, which encourages the firm to provide training. We show that the model can lead to multiple equilibriums. In one equilibrium, quits are endogenously high; as a result, employers have limited monopsony power and are willing to supply only a little training. In another equilibrium, quits are low, and training supplied is high. We also derive predictions from our model not shared by other explanations of firm-sponsored training. Using microdata from Germany, we

reject the predictions of the specific human capital model, while finding that the data support our model.

The Returns to Computer Use Revisited: Have Pencils Changed the Wage Structure Too?

John E. DiNardo and Jörn-Steffen Pischke

NBER Working Paper No. 5606

June 1996

JEL Nos. J3, O33

Labor Studies

Are the large measured wage differentials associated with on-the-job computer use gains in productivity or the result of unobserved heterogeneity? We examine this issue with three large cross-sectional surveys from Germany. First, we confirm that the estimated wage differentials associated with computer use in Germany are very similar to the U.S. differentials. Second, using the same techniques, we measure large wage differentials for on-the-job use of calculators, telephones, pens or pencils, or for those who work while sitting down. Along with our reanalysis of the U.S. data, these findings cast some doubt on the interpretation of the computer-use wage differential as reflecting productivity effects arising from the introduction of computers in the workplace.

Stock Market Yields and the Pricing of Municipal Bonds

N. Gregory Mankiw and James M. Poterba

NBER Working Paper No. 5607

June 1996

Asset Pricing, Economic Fluctuations and Growth, Monetary Economics, Public Economics

We propose an alternative to the traditional model for explaining the

spread between taxable and tax-exempt bond yields. This alternative model is a special case of a general class of clientele models of portfolio choice and asset market equilibrium. In particular, we consider a setting with two types of investors—taxable and tax-exempt—who hold specialized bond portfolios. The tax-exempt investor holds only taxable bonds, and the taxable investor holds only tax-exempt bonds. Both investors hold equity, and the markets for taxable and tax-exempt bonds are linked through the equilibrium conditions governing equity- and bond-holding for each type of investor. In contrast to the traditional model, this alternative has the potential to explain the small observed spread between taxable and tax-exempt yields. In addition, this model predicts that the yield spread between taxable and tax-exempt bonds should be an increasing function of the dividend yield on corporate stocks. Although the substantial changes in the tax code during the last four decades complicate the testing of this model, we find some support for the predicted relationship between the equity dividend yield and the yield spread between taxable and tax-exempt bonds.

Spousal Labor Supply as Insurance: Does Unemployment Insurance Crowd Out the Added Worker Effect?

Jonathan Gruber and Julie Berry Cullen

NBER Working Paper No. 5608

June 1996

JEL Nos. J64, J65, J22

Public Economics, Labor Studies

In this paper, we consider the role of spousal labor supply as insurance against spells of unemployment. Standard theory suggests

that women should work more when their husbands are out of work (that is the "Added Worker Effect," or AWE), but there has been little empirical support for this contention. We also find little evidence of an AWE during 1984-93. We suggest that one reason for the absence of the AWE may be that unemployment insurance (UI) provides a state-contingent income stream that counteracts the negative income shock from the husband's unemployment. In fact we find that increases in the generosity of UI lower the labor supply of wives of unemployed husbands. Our results suggest that UI crowds out a sizable fraction of offsetting spousal earnings in response to unemployment spells, although even in the absence of a UI system, the spousal response would make up only a small share of the associated reduction in family income. We also find that families are making labor supply decisions in a life-cycle context, since UI also has effects on the labor supply of wives of employed husbands who face high unemployment risk. Yet, couples do not appear able to smooth the labor supply response to UI income flows equally over periods of employment and unemployment, suggesting the presence of liquidity constraints. Finally, wives in families with small children are more responsive to UI benefits in their labor supply decisions, which is consistent with the notion that they have a higher opportunity cost of market work.

The Wealth of Cohorts: Retirement Saving and the Changing Assets of Older Americans

Steven F. Venti and David A. Wise

NBER Working Paper No. 5609

June 1996

Aging, Public Economics

Personal retirement accounts are becoming an increasingly important form of retirement saving. Using data from the Survey of Income and Program Participation, we consider the effect of this change on the assets of recent retirees and people who are approaching retirement. Much of our analysis is based on comparisons of younger and older cohorts with different lengths of exposure to personal retirement saving programs. We find that personal retirement saving already has added substantially to the personal financial assets of older families. Projections imply that the personal financial assets of the cohort that will reach age 76 in 28 years will be almost twice as large as the personal financial assets of the cohort that reached that age in 1991. Our results also indicate that there has been little replacement to date of employer-provided pension saving with personal retirement saving. Together with evidence that personal financial saving is unrelated to changes in home equity, the results suggest that personal retirement saving will lead to an important increase in the overall wealth of the elderly.

Consumption and the Stock Market: Interpreting International Experience

John Y. Campbell

NBER Working Paper No. 5610

June 1996

JEL No. G12

Asset Pricing, Economic Fluctuations and Growth, Monetary Economics

This paper reviews the behavior of stock prices in relation to consumption. It lists some important stylized facts that characterize U.S. data, and relates them to recent de-

velopments in equilibrium asset pricing theory. I examine data from other countries to see which features of the U.S. experience apply more generally. The paper argues that, to make sense of stock market behavior, one needs a model in which investors' risk aversion is both high and varying, such as the external habit-formation model of Campbell and Cochrane (1995).

Keynesianism, Pennsylvania Avenue Style: Some Economic Consequences of the Employment Act of 1946

J. Bradford De Long

NBER Working Paper No. 5611

June 1996

JEL Nos. E6, N1

Development of the American Economy, Monetary Economics

The Employment Act of 1946 created the Council of Economic Advisers (CEA) as an institution, and serves as a convenient marker of a broader change in opinions and sentiments: the assumption by the federal government of the role of stabilizing the macroeconomy.

The magnitude of this shift should not be understated: before the Great Depression, strong currents of macroeconomic theory held that stabilization policy was positively *unwise*. It solved problems in the present only by storing up deeper and more dangerous problems for the future. Yet as a result of the shift in opinions and sentiments marked by the 1946 Employment Act, no government since World War II has dared do anything other than let fiscal automatic stabilizers swing into action during recession. This may well have been a significant force tending to moderate the post-World War II business cycle.

The bulk of the CEA's time and

energy now and in the past has been devoted not to macroeconomic but to microeconomic issues, though. The CEA has been one of the few governmental advocates of the public interest in allocative efficiency. The CEA has been more successful in its microeconomic role than many would have predicted *ex ante*. Its relative success can be traced to the staffing pattern set up by two strong early chairs—Arthur F. Burns and Walter Heller—who made sure that the CEA staff was composed largely of short-term appointees whose principal loyalties were to the discipline of economics, and who as a result were less vulnerable to the processes that block pressure for allocative efficiency in other parts of the government.

Foreign Direct Investment and Keiretsu: Rethinking U.S. and Japanese Policy
David E. Weinstein

NBER Working Paper No. 5612

June 1996

International Trade and Investment

This paper focuses on two issues. First, I reexamine the data on the level of foreign direct investment (FDI) in Japan, and find that foreign firms sell five to six times more in Japan than is commonly believed. Previous studies severely underestimated the stock of FDI in Japan because of poor data. Second, after finding that the level of FDI in Japan is still low, even after adjusting for various factors, I explore various explanations for this phenomenon. My second main conclusion is that government tax and financial policy continues to inhibit foreign takeovers through the promotion of stable shareholding.

Does It Pay to Attend an Elite Private College? Cross-Cohort Evidence on the Effects of College Quality on Earnings

**Domenic J. Brewer,
 Eric Eide, and
 Ronald G. Ehrenberg**

NBER Working Paper No. 5613

June 1996

JEL No. I21

Labor Studies

While there is evidence of a substantial and rising labor market premium associated with college attendance in general, little is known about how this premium varies across institutions of different quality, and over time. Previous research that estimated the return to college quality did not take into account that individuals probably select the type of college they attend based in part on the expected economic return and net costs. In this paper, we explicitly model high school students' choice of college type based on individual and family characteristics (including ability and parental economic status), an estimate of the net costs of attendance, and expected labor market return. We estimate equations for selectivity and corrected outcome using data from both the National Longitudinal Study of the High School Class of 1972 and High School and Beyond; these permit us to determine the effects of college quality on wages and earnings, and to estimate how this effect varies over time. Even after controlling for selection effects, we find strong evidence of significant economic return to attending an elite private institution, and some evidence that this premium has increased over time.

The Costs and Benefits of Fiscal Rules: Evidence from U.S. States

**Alberto Alesina and
 Tamim Bayoumi**

NBER Working Paper No. 5614

June 1996

Monetary Economics, Public Economics

This paper shows that in U.S. states, balanced budget rules are effective in enforcing fiscal discipline but have no costs, in terms of increased variability of output. More specifically, we show that tighter fiscal rules are associated with larger average surplus and lower cyclical variability of the budget balance. However, the lower flexibility of the budget balance does not affect variability of state output.

Roe V. Wade and American Fertility

**Phillip B. Levine,
 Douglas Staiger,
 Thomas J. Kane, and
 David J. Zimmerman**

NBER Working Paper No. 5615

June 1996

JEL Nos. J13, I10

Health Care

This paper considers the effect of abortion legalization on births in the United States. A simple theoretical model demonstrates that the impact of abortion legalization on the birthrate is ambiguous, because both pregnancy and abortion decisions could be affected. We use variation in the timing of legalization across states in the early 1970s to estimate the effect of abortion on birthrates. Our findings indicate that states legalizing abortion experienced a 5 percent decline in births relative to other states. Among teens, women over 35, and nonwhite women the decline was even greater: 13 percent, 8 percent,

and 12 percent respectively. Out-of-wedlock births declined by twice as much as births to married women. If legalization in some states affected birthrates in neighboring states (through travel to obtain an abortion), then comparing births between states alone will underestimate the actual reduction. Using more distant comparison states increases the estimated impact of abortion legalization on birthrates to about 8 percent. Applying this estimate to the current level of births, a complete recriminalization of abortion would result in 320,000 additional births per year.

Computer Use and Productivity Growth in Federal Government Agencies, 1987 to 1992

William Lehr and Frank R. Lichtenberg

NBER Working Paper No. 5616

June 1996

JEL Nos. H5, J23, J24, O3, O4

Productivity

This paper examines trends in computer usage and the effect on productivity growth for a sample of federal government agencies from 1987 to 1992. We link data from the Bureau of Labor Statistics on the growth in real output per employee with data from a marketing research firm, Computer Intelligence, on the growth in per capita computer assets for a sample of 44 federal agencies. The data show that computer usage increased dramatically; that there was a shift toward more powerful, lower-cost, distributed systems; and that usage diffused more extensively throughout the sampled agencies. These trends mirror, while perhaps lagging, those experienced by large private firms over the same period. From estimates of a Cobb-Douglas production function for govern-

ment services, we derive an estimated output elasticity for computers of 0.06, which allows us to conclude that computers contributed significantly to output growth, thereby refuting the "Computer Productivity Paradox" as it applies to the public sector. Computers do not appear to be responsible for the disappointing productivity performance of the service sector. Although the magnitude of our estimated elasticity suggests that the returns to computer investments exceeded those to other types of capital, our results are not conclusive. We also observe a positive correlation between increased computer usage and compensation growth that is consistent with skill-biased technical change.

Networks Versus Markets in International Trade

James E. Rauch

NBER Working Paper No. 5617

June 1996

JEL No. F10

International Trade and Investment

I propose a network/search view of international trade in differentiated products. My evidence supports the view that proximity and common language/colonial ties are more important for differentiated products than for products traded on organized exchanges in matching international buyers and sellers. Further, search barriers to trade are higher for differentiated than for homogeneous products. I also discuss alternative explanations for the findings.

Trade and Search: Social Capital, *Sogo Shosha*, and Spillovers

James E. Rauch

NBER Working Paper No. 5618

June 1996

JEL Nos. F10, F13

International Trade and Investment

I propose a network/search view of international trade in differentiated products. I show that this view can explain the importance of ethnic and extended family ties in trade, the success of diversified trading intermediaries such as Japan's *sogo shosha*, and the ubiquity of government export promotion policies such as subsidized trade missions.

Age Discrimination, Job Separations, and Employment Status of Older Workers: Evidence from Self-Reports

Richard W. Johnson and David Neumark

NBER Working Paper No. 5619

June 1996

JEL Nos. J18, J26, J71, J78

Labor Studies

This paper explores the prevalence and consequences of age discrimination in the workplace by analyzing self-reports of discrimination made by respondents in the National Longitudinal Survey of Older Men. Age discrimination was reported in 7 percent of our cases, during 1966-80. Workers with positive reports were much more likely to separate from their employer, and less likely to remain employed, than workers who report no age discrimination. The estimated effect of reported discrimination remains large and significant, even after we control for the existence of mandatory retirement provisions on the current job. These findings are generally robust to numerous attempts to correct the estimates for the inherent limitations of self-reported data, particularly the potential heterogeneity bias that arises from differences in the propensity to report discrimination, and the possibility

that discrimination is reported in response to other negative labor market outcomes.

Does European Unemployment Prop Up American Wages?

Donald R. Davis

NBER Working Paper No. 5620

June 1996

JEL Nos. F11, J31, E24

International Trade and Investment

I consider trade between a flexible-wage America and a rigid-real-wage Europe. In a benchmark case, a move from autarky to free trade doubles the European unemployment rate, while it raises the American unskilled wage to the high European level. Entry of the unskilled "South" to world markets raises unemployment in Europe. But Europe's commitment to the high wage completely insulates America from the shock. Immigration to America raises American income, but lowers European income dollar-for-dollar, while European unemployment rises one-for-one. I consider a stylized game of the choice of factor market institutions. Mitterand's Europe chooses a high minimum wage and Reagan's America chooses a flexible wage for the unskilled. Paradoxically, unskilled workers are worse off in Europe. Trade equalizes wages, but Europeans bear all of the unemployment required to sustain the high wage.

Trade Sensitivity, Technology, and Labor Displacement

**John T. Addison,
Douglas A. Fox, and
Christopher J. Ruhm**

NBER Working Paper No. 5621

June 1996

JEL Nos. F15, J68

Labor Studies, International Trade and Investment

This study examines the relationship among international trade, technology, and (the probability and consequences of) job displacement, using data on displaced workers as well as those at risk of job dislocation for 1984-6 and 1989-91. Workers employed in industries with elevated import shares and high levels of investment in computers appear to have increased rates of job loss, with the results for export penetration varying with the time period examined. However, these risks do not translate into unfavorable labor market outcomes after displacement. Indeed, there is some evidence that individuals displaced from export-oriented sectors have fewer adjustment problems than the majority of dislocated workers, while those terminated from sectors investing heavily in computer technologies are more likely to retain health insurance coverage. That being said, our findings are frequently sensitive to the choice of specifications and time periods.

Financial Capital, Human Capital, and the Transition to Self-Employment:

Evidence from Intergenerational Links

**Thomas Dunn and
Douglas Holtz-Eakin**

NBER Working Paper No. 5622

June 1996

JEL Nos. J23, J24, M13

Labor Studies, Public Economics

The environment for business creation is central to economic policy, since entrepreneurs are believed to be forces of innovation, employment, and economic dynamism. We use data from the National Longitudinal Surveys to investigate the relative importance of financial and human capital, exploiting the variation provided by

intergenerational links. Specifically, we estimate the impacts of parental wealth and human capital on the probability that an individual will make the transition from a wage-and-salary job to self-employment.

We find that the financial assets of young men exert a statistically significant, but quantitatively modest, effect on their transition to self-employment. In contrast, the capital of parents exerts a large influence. The strongest effect of parents runs not through financial means but rather through human capital, that is, the intergenerational correlation in self-employment. This link is even stronger along gender lines.

Affine Models of Currency Pricing

**David Backus, Silverio Foresi,
and Chris Telmer**

NBER Working Paper No. 5623

June 1996

JEL Nos. F31, G12, G15

Asset Pricing, International Finance and Macroeconomics

Perhaps the most puzzling feature of currency prices is the tendency for high interest rate currencies to appreciate, when the expectations hypothesis suggests that the reverse will occur. Some have attributed this *forward premium anomaly* to a time-varying risk premium, but the theory has been largely unsuccessful in producing a risk premium with the requisite properties.

We characterize the risk premium in a general arbitrage-free setting and describe the features a theory must have to account for the anomaly. In affine models, the anomaly requires either that state variables have asymmetric effects on state prices in different currencies, or that we abandon the common requirement that interest rates be strictly positive.

Perceptions of Equity and the Distribution of Income

Julio J. Rotemberg

NBER Working Paper No. 5624

June 1996

JEL No. D63

Economic Fluctuations and Growth

I build a simple model in which there is a connection between employees' perception of the "fairness" of employers and the actual distribution of income. Wages are based in part on employers' assessments of the productivity of individual employees. I show that the equilibrium distribution of income depends on the beliefs of employees about the accuracy of these evaluations. I state conditions under which the distribution of income across employees of the same vintage will be more equal if employees believe that these evaluations are generally inaccurate (so that they are skeptical of capitalists in general) than if they believe that these evaluations are accurate. My model is consistent with the fact that, in a sample of seven countries, the distribution of income is less equal in countries where people feel that income inequality is not too large.

The Heckscher-Ohlin-Vanek Model of Trade: Why Does It Fail?

When Does It Work?

**Donald R. Davis,
David E. Weinstein,
Scott C. Bradford, and
Kazushige Shimpo**

NBER Working Paper No. 5625

June 1996

JEL Nos. F1, D5

International Trade and Investment

The Heckscher-Ohlin-Vanek (HOV) model of factor service trade is a central construct in international economics. Empirically,

though, it is a flop. This warrants a new approach. Using Japanese regional data, we are able to test the HOV model by independently examining its component production and consumption elements. The strict HOV model performs poorly because it cannot explain the international location of production. However, relaxing the assumption of universal factor price equalization yields a dramatic improvement. We also solve most of what Treffer (1995) calls the "mystery of the missing trade." In sum, the HOV model performs remarkably well.

Wages, Productivity, and Worker Characteristics: Evidence from Plant-Level Production Functions and Wage Equations

**Judith K. Hellerstein,
David Neumark, and
Kenneth R. Troske**

NBER Working Paper No. 5626

June 1996

JEL Nos. J24, J71, J41

Labor Studies

We use a unique new dataset that combines individual worker data with data on workers' employers to estimate plant-level production functions and wage equations, and thus to compare relative marginal products and relative wages for various groups of workers. The data and empirical framework lead to new evidence on a number of questions about the determination of wages, questions that hinge on the relationship between wages and marginal products of workers in different demographic groups. These include race and sex discrimination in wages, the causes of rising wages over the life cycle, and the returns to marriage.

We find first that workers who have been married are more productive than never-married work-

ers and are paid accordingly. Second, prime-aged workers (aged 35-54) are as productive as younger workers; in some specifications, we estimate that they receive higher wages. However, older workers (aged 55+) are less productive than younger workers, but are paid more. Third, the data indicate no difference between the relative wage and relative productivity of black and white workers. Finally, with the exception of those in managerial and professional occupations, women are paid about 25-35 percent less than men, but estimated productivity differentials between women and men are generally no larger than 15 percent, and are thus significantly smaller than the pay differential.

Relative Price Variability and Inflation: Evidence from U.S. Cities

Guy Debelle and Owen Lamont

NBER Working Paper No. 5627

June 1996

JEL No. E31

Monetary Economics

We test whether the positive correlation between inflation and intermarket relative price variability over time is also present in a cross section of U.S. cities. We find this correlation to be robust: cities that have higher-than-average inflation also have higher-than-average relative price dispersion, *ceteris paribus*. This result holds for different periods of time, different classes of goods, and across different time horizons. Our results suggest that at least part of the relationship between inflation and relative price variability cannot be explained by monetary factors.

R and D Spillovers and Global Growth

**Tamim Bayoumi,
David T. Coe, and
Elhanan Helpman**

NBER Working Paper No. 5628

June 1996

JEL Nos. O31, O40

International Trade and Investment

Using a world econometric model, we examine the growth-promoting roles of R and D, international spillovers of R and D, and trade. A country can raise its total factor productivity by investing in R and D. But countries also can boost their productivity by trading with other countries that have large "stocks of knowledge" from their cumulative R and D activities. We use a special version of MULTIMOD that incorporates R and D spillovers among industrial countries and from industrial countries to developing countries. Our simulations suggest that R and D, R and D spillovers, and trade all play important roles in boosting growth in industrial and developing countries.

Expected Homeownership and Real Wealth Accumulation of Youth

**Donald R. Haurin,
Patrick H. Hendershott,
and Susan M. Wachter**

NBER Working Paper No. 5629

June 1996

JEL Nos. E21, R21

Public Economics

This paper describes the real wealth accumulation of American youth and relates this behavior to variations in real, constant-quality house prices where they live. We argue that increases in these house prices have two offsetting effects on wealth. First, the greater is the local constant-quality price of housing, the greater is the wealth needed to meet the lender-

imposed downpayment constraint if housing demand is not price elastic. However, increased real, constant-quality house prices reduce the likelihood of homeownership, and thus the desire to accumulate the wealth needed for a downpayment.

Using a panel dataset for youth age 20–33 for 1985 through 1990, we find that the combined direct and indirect impact of variations in real, constant-quality house prices on wealth is modest for changes near the average real house price, but that youths' wealth declines substantially in areas with high real house prices.

Borrowing Constraints and the Tenure Choice of Young Households

**Donald R. Haurin,
Patrick H. Hendershott,
and Susan M. Wachter**

NBER Working Paper No. 5630

June 1996

JEL No. R21

Public Economics

We analyze the factors that affect the tenure choice of young adults, highlighting the impact of constraints on borrowing imposed by the mortgage lender. The dataset is a panel of youth age 20–33 for 1985–90. Our methods differ from those of prior studies in many ways, including consideration of possible sample selection bias, a richer model of the stochastic error structure, better measurement of which households are bound by borrowing constraints, and a fuller consideration of the endogeneity of wealth and income. Once all changes are implemented, we find that ownership tendencies are quite sensitive to economic variables. Specifically, potential earnings, the relative cost of owning a home, and especially constraints on bor-

rowing affect the tendency to own a home. In our sample of youth, even after choosing their loan-to-value ratio to minimize the impact of the separate wealth and income requirements, 37 percent of households are constrained. The constraints reduce the probability of ownership among these households by 10 to 20 percentage points (one-third to one-half), depending on the particular characteristics of the household.

Is the Time-Series Evidence on Minimum Wage Effects Contaminated by Publication Bias?

**David Neumark and
William Wascher**

NBER Working Paper No. 5631

June 1996

JEL Nos. C10, J23, J38

Labor Studies

Publication bias in economics may lead to selective specification searches that result in overreporting in the published literature of results consistent with economists' priors. In reassessing the published time-series studies on the employment effects of minimum wages, some recent research has reported evidence consistent with publication bias, and concluded that the most plausible explanation of this evidence is "editors' and authors' tendencies to look for negative and statistically significant estimates of the employment effect of the minimum wage," (Card and Krueger, 1995a, p. 242).

We present results indicating that the evidence is more consistent with a change in the estimated minimum wage effect over time than with publication bias. More generally, we demonstrate that existing approaches to testing for publication bias may generate spurious evidence of such bias when

there are structural changes in some parameters. We then suggest an alternative strategy for testing for publication bias that is more immune to structural change. Although changing parameters may be uncommon in clinical trials on which most of the existing literature on publication bias is based, it is much more plausible in economics.

Observations on International Labor Standards and Trade

Alan B. Krueger

NBER Working Paper No. 5632

June 1996

JEL Nos. J38, F13

Labor Studies

This paper reviews the theoretical arguments for and against linking international labor standards to trade. Based on theory alone, it is difficult to generalize about the effect of labor standards on efficiency and equity. Some economists have argued that international labor standards are merely disguised protectionism. An evaluation of determinants of support for legislation that would ban imports to the United States of goods made with child labor provides little support for the prevailing political economy view. In particular, members of Congress representing districts with relatively many unskilled workers, who are most likely to compete with child labor, are less likely to support a ban on imports made with child labor. Another finding is that the prevalence of child labor declines sharply with national income. Last, an analysis of compulsory schooling laws, which are often suggested as an alternative to prohibiting child labor, finds a tremendous amount of noncompliance in developing nations.

Trade and Wages: Insights from the Crystal Ball

Robert Z. Lawrence and Carolyn L. Evans

NBER Working Paper No. 5633

June 1996

International Trade and Investment

This study uses a net factor content analysis and a small simulation model to explore the impact on the U.S. labor market of a fivefold increase in imports of manufactured goods from developing countries. The simulation, which is parameterized by the U.S. economy in 1990, involves an expansion of balanced trade that displaces almost half of U.S. manufacturing workers who are then reemployed in the remaining manufacturing and non-trade sectors. Our results show that relative wages of workers with a high school education or less would be depressed, while those of workers with some college education would rise. However, despite the magnitude of the shock, the effects are surprisingly small. Once we consider productivity increases, labor force growth, and export sector wage premiums, and given unitary elasticities of demand and of substitution between workers with different levels of education, the relative wages of workers with some college education rise by 3.5 percent, while the real wages of workers with a high school education or less decline by 1.3 percent. We also explore the impact of a variety of parameter assumptions.

Imperfect Competition and the Effects of Energy Price Increases on Economic Activity

Julio J. Rotemberg and Michael Woodford

NBER Working Paper No. 5634

June 1996

JEL Nos. E52, L13, L71

Economic Fluctuations and Growth

We show that modifying the standard neoclassical growth model by assuming that competition is imperfect makes it easier to explain the size of the declines in output and real wages that follow increases in the price of oil. Plausibly parameterized models of this type are able to mimic the response of output and real wages in the United States. The responses are particularly consistent with a model of implicit collusion in which markups depend positively on the ratio of the expected present value of future profits to the current level of output.

Hyperbolic Discount Functions, Undersaving, and Savings Policy

David I. Laibson

NBER Working Paper No. 5635

June 1996

JEL Nos. D91, E21, H2

Asset Pricing

Studies of animal and human behavior suggest that discount functions are approximately hyperbolic (Ainslie, 1992). I analyze an economy with complete markets that is populated by hyperbolic consumers. I identify two ways that such an economy can be distinguished from an exponential economy. First, hyperbolic discounting predicts the empirical regularity that the elasticity of intertemporal substitution is less than the inverse of the coefficient of relative risk aversion. Second, hyperbolic discounting explains many features of the policy debate about undersaving. The calibrated hyperbolic economy matches Bernheim's (1994) survey data on self-reported undersaving, and predicts prosavings government interventions, such as capital-income subsidies and penalties for early withdrawal

from retirement accounts. Hyperbolic consumers are willing to sacrifice nine-tenths of a year's worth of income to induce the government to implement optimal revenue-neutral saving incentives.

Technology, Unemployment, and Relative Wages in a Global Economy

Donald R. Davis

NBER Working Paper No. 5636

June 1996

JEL Nos. F11, J31, E24, O33

International Trade and Investment

Arguably the most important development in recent decades in U.S. factor markets is the decline in the relative wage of the unskilled. By contrast, in Europe it is undoubtedly the rise and persistence of unemployment. Technology has been identified as a key reason for the rising U.S. wage inequality, while labor market rigidities often are cited as a key reason for European unemployment. This paper seeks to provide a unified account of these major factor market developments. It models the impact of technical change on relative wages and unemployment in a world in which one country has flexible and the other rigid labor market institutions. The results depart significantly but sensibly from what one would expect in a world with fully flexible wages. A few stylized facts help to narrow the field to a few candidates to account for these factor market developments.

Contracts and Money

Boyan Jovanovic and Masako Ueda

NBER Working Paper No. 5637

June 1996

JEL No. E4

Productivity

We analyze the contractual rela-

tionship between workers and their employers when there is nominal risk. The key feature of the problem is that the consumption deflator is random, and only observed sometime after the effort is exerted. The worker's effort is not observable, and to induce the agent to work, second-best contracts do not insure the worker fully. They do eliminate all nominal risk for the parties (by fully indexing the terms of the contracts to the price level), but they would be renegotiated. Foreseeing this, the parties to the contract will write one that is renegotiation-proof. Under such a contract, nominal shocks affect real consumption. Since the argument should apply in many situations, it will have macroeconomic implications, one of which is short-run nonneutrality of money. We have found that surprise money is likely to redistribute consumption and welfare toward workers, and away from shareholders.

Arbitrage Opportunities in Arbitrage-Free Models of Bond Pricing

David Backus, Silverio Foresi, and Stanley Zin

NBER Working Paper No. 5638

June 1996

JEL Nos. E43, G12, G13

Asset Pricing

Mathematical models of bond pricing are used by both academics and Wall Street practitioners, with practitioners introducing time-dependent parameters to fit "arbitrage-free" models to selected asset prices. In a simple one-factor setting, we show that the ability of such models to reproduce a subset of security prices need not extend to state-contingent claims more generally. The popular Black-Derman-Toy model, for example, overprices call options on long bonds

relative to those on short bonds when interest rates exhibit mean reversion. We argue, more generally, that the additional parameters of arbitrage-free models should be complemented by close attention to fundamentals, which might include mean reversion, multiple factors, stochastic volatility, and/or non-normal interest rate distributions.

An Analysis of Divisional Investment Policies

Hyun-Han Shin and

René M. Stulz

NBER Working Paper No. 5639

June 1996

Corporate Finance

This paper investigates the divisional investment policies of diversified firms. We find that investment of the smallest division of diversified firms is related significantly to the cash flow of the other segments. We then show that the smallest division's investment is more sensitive to the cash flow of the other divisions for firms in which one expects aggregate investment also to be related to cash flow, namely low q firms and firms with high leverage. This and other evidence that we provide is consistent with what we call the bureaucratic rigidity hypothesis. This hypothesis states that relative allocations of investment funds in diversified firms are sticky. We fail to find support for the view that diversified firms allocate more funds to divisions in industries with better investment opportunities.

Insurance or Self-Insurance? Variation, Persistence, and Individual Health Accounts

Matthew J. Eichner,

Mark B. McClellan, and

David A. Wise

NBER Working Paper No. 5640

June 1996

Health Care, Public Economics

We explore the feasibility of catastrophic health insurance established in conjunction with individual health accounts (IHAs). Under this plan, the employer establishes both a high-deductible health insurance plan and an IHA. Employee health care costs below the deductible then are paid out of the IHA; costs above the deductible are paid by the insurance plan. Assets remaining in the account when the employee retires are available for other purposes.

Although attractive because it helps to solve the "moral hazard" problem associated with conventional insurance plans, the scheme may be considered infeasible if medical expenditures over a working life are so persistent that certain individuals accumulate little in the IHA while others accumulate a great deal. Within the context of an illustrative IHA plan, we develop preliminary empirical evidence on the distribution of medical expenditures—and hence savings—under an IHA plan. Our analysis is based on longitudinal health insurance claims data from a large firm. We emphasize the balance in the IHA account at retirement. Although such a plan would produce a range of balances across employees, approximately 80 percent would retain over 50 percent of their contributions. Only about 5 percent would retain less than 20 percent of their contributions.

The outcomes suggest to us that such a plan is feasible. And, we believe that such a plan could be structured to increase retirement savings.

Revenue-Raising Versus Other Approaches to Environmental Protection: The Critical Significance of Preexisting Tax Distortions

**Lawrence H. Goulder,
Jan W. H. Parry, and
Dallas Burtraw**

NBER Working Paper No. 5641

June 1996

JEL Nos. D62, H21, L51

Public Economics

This paper examines the choice between revenue-raising and non-revenue-raising (NRR) instruments for environmental protection in a second-best setting with preexisting taxes on factors. We find that interactions with preexisting taxes fundamentally influence the costs of regulation and seriously militate against pollution abatement policies that do not raise revenue. Indeed, if the marginal environmental benefits from reductions in pollution are below a certain threshold value, then any amount of pollution abatement through NRR policies, for example emissions quotas, will reduce efficiency. Under conditions roughly approximating SO₂ emissions from electric power plants in the United States, efficiency gains vanish if marginal environmental benefits are below \$109 per ton and an NRR policy is employed. Moreover, imposing the "Pigouvian" (rather than second-best optimal) level of quotas can reduce welfare, even when environmental benefits are as high as \$220 per ton. These results are largely independent of the size of the regulated sector relative to the overall economy.

These findings stem from two underlying effects. The *tax-interaction effect* is the adverse impact on factor markets that arises from reductions in aftertax returns to fac-

tors; the reductions are associated with the higher production costs caused by environmental regulation. This effect leads to significantly higher efficiency costs than what would occur in a first-best world with no preexisting taxes. Revenue-raising regulations (taxes) enjoy a *revenue-recycling effect* that offsets much of the tax-interaction effect, but NRR regulations (quotas) enjoy no such offset. Consequently, for any given target level of emissions reduction, the gross efficiency costs of NRR policies are higher than those of revenue-raising policies.

These general equilibrium results are relevant to government regulation outside the environmental area. To the extent that government regulations of international trade or agricultural production raise the costs of output and thereby reduce real factor returns, they can generate much higher social costs than would be indicated by partial equilibrium analyses.

Public School Finance in a General Equilibrium Tiebout World: Equalization Programs, Peer Effects, and Private School Vouchers

Thomas J. Nechyba

NBER Working Paper No. 5642

June 1996

JEL Nos. I22, I28, H70

Public Economics

This paper uses computable general equilibrium simulations to investigate the effect of private school vouchers. It improves on past computational approaches by: 1) endogenizing the funding of public schools through the modeling of an explicit political process at the school district level; 2) embedding the private/public school

choice in a Tiebout model in which agents also choose between communities that provide different public school/property tax packages; and 3) allowing for a variety of different public school financing mechanisms ranging from purely local financing and control all the way to pure state funding. While voucher programs increase school-based stratification of agents, they tend to decrease residence-based stratification. This implies that untargeted vouchers may be equity-enhancing under some institutional settings even when there are no direct improvements in public school efficiency from increased competition. Furthermore, the effects of targeting vouchers to low-income districts may not differ significantly from the effects of untargeted voucher plans.

Local Labor Markets and Welfare Spells: Do Demand Conditions Matter?

Hilary Williamson Hoynes

NBER Working Paper No. 5643

June 1996

JEL Nos. I38, J23, R23

Public Economics, Labor Studies

This paper examines the role of local labor markets in determining how long families receive benefits from the Aid to Families with Dependent Children (AFDC) program. Given the current policy emphasis on devolution and reducing the AFDC caseload through employment, understanding the role of local labor demand is important. The study uses a unique dataset based on administrative data that have detailed information on welfare spells for over 100,000 AFDC cases. The empirical work is based on estimates of a duration model in which the hazard rate is a function of demographic characteristics, local labor market variables, neigh-

borhood characteristics, county fixed effects, and time effects. I use several alternative measures of local labor market conditions, and the results show that higher unemployment rates, lower employment growth, lower employment-to-population ratios, and lower wage growth are associated with longer welfare spells. On average, a typical employment fluctuation over the business cycle, if permanent, would lead to an 8–10 percent reduction in the AFDC caseload. Typical changes in real quarterly earnings generate somewhat smaller effects. The combined effect of these two changes, if permanent, would lead to sizable reductions in the caseload, on the order of 15 percent. The estimated labor market effects are robust to including county-level fixed effects and time effects. AFDC-UP participants, blacks, and residents of urban areas are more sensitive to changes in economic conditions, while teen parents and refugee groups are much less sensitive to changes in local labor market conditions.

Work, Welfare, and Family Structure: What Have We Learned?

Hilary Williamson Hoynes

NBER Working Paper No. 5644

July 1996

JEL Nos. I38, J22, J12

Public Economics, Labor Studies

Welfare reform once again has made its way to the top of the domestic policy agenda. While part of the motivation behind current reform efforts is driven fiscally, there is also an interest in making significant changes to address two prominent criticisms of the existing system of public assistance programs in the United States. First, the system has significant, adverse work incentives. Second, the system dis-

courages the formation of two-parent families and is responsible in a major way for the high, and rising, rates of female headship and out-of-wedlock birth rates. This paper explores the validity of these criticisms using the available empirical evidence and, in turn, evaluates the impact of various reforms to the system. The programs I examine include Aid to Families with Dependent Children, Food Stamps, and Medicaid. The paper relies on evidence based on three sources of variation in welfare policy: cross-state variation, over-time variation, and demonstration projects at the state level. I conclude that current reforms aimed at reducing female headship and out-of-wedlock births—such as “family caps,” eliminating benefits for teens, and equal treatment of two-parent families—are unlikely to generate large effects. Changes to implicit tax rates and benefit formulas may increase work among current recipients, but overall work effort may not be affected. These predictions should be accompanied by a word of caution: many of the proposed changes never have been implemented at the state or federal level and require out-of-sample predictions. Current state experimentation may help fill this gap.

Measuring the Effects of Cognitive Ability

John Cawley, Karen Conneely, James J. Heckman, and Edward Vytalil

NBER Working Paper No. 5645

July 1996

JEL Nos. J24, J33, J31, J7

Labor Studies

This paper presents new evidence from the National Longitudinal Survey of Youth on the importance of meritocracy in American society. We find that general intelli-

gence, or "g"—a measure of cognitive ability—is dominant in explaining the variance of test scores. The weights assigned to tests by "g" are similar for all major demographic groups. These results support Spearman's theory of "g."

We also find that "g" and other measures of ability are not rewarded equally across race and gender, evidence against the view that the labor market is organized on meritocratic principles. Additional factors beyond "g" are required to explain wages and occupational choice. However, both blue collar and white collar wages are predicted poorly by "g," or even multiple measures of ability. Observed cognitive ability is only a minor predictor of social performance. White collar wages are more "g"-loaded than blue collar wages. Many non-cognitive factors determine blue collar wages.

Long-Run PPP May Not Hold After All

Charles M. Engel

NBER Working Paper No. 5646

July 1996

International Finance and
Macroeconomics

Recent tests using long data series find evidence in favor of long-run purchasing power parity (PPP). These tests may have reached the wrong conclusion, though. Monte Carlo experiments using artificial data calibrated to nominal exchange rates and disaggregated data on prices show that tests of long-run PPP have serious size biases. They may fail to detect a sizable and economically significant unit root component. For example, in the baseline case that is calibrated to actual price data, unit roots and cointegration tests with a nominal size of 5 percent have true sizes that range from 0.90 to 0.98 in

artificial 100-year-long data series, even though the unit root component accounts for 42 percent of the variance of the real exchange rate in sample. On the other hand, tests of stationarity have very low power in the same circumstances, so it is quite likely that a researcher would reject a unit root and fail to reject stationarity even when the series embodied a large unit root component.

The Effects of Childbearing on Married Women's Labor Supply and Earnings: Using Twin Births as a Natural Experiment

**Jaisri Gangadharan and
Joshua L. Rosenbloom**

NBER Working Paper No. 5647

July 1996

JEL Nos. J22, J16, J13

Married women's decisions about childbearing and market work are interrelated importantly. Although there are many estimates of the effects of fertility on female labor supply, few have addressed adequately the problems of simultaneity that are inherent in these choices. In this paper, we use exogenous variations in fertility attributable to twin births to measure the impact of an unanticipated child on married women's labor supply and earnings. We find that the short-run effects of an unanticipated birth on labor supply are appreciable and have increased as more mothers enter the labor market. It also appears that the impact of unanticipated births on earnings and wages has changed from 1980 to 1990. In 1980, reduced labor supply caused a temporary drop in earnings; in 1990, earnings and wages remained depressed well after the labor supply effects of a twin birth had disappeared.

Executive Compensation, Strategic Competition, and Relative Performance Evaluation: Theory and Evidence

**Rajesh Aggarwal and
Andrew A. Samwick**

NBER Working Paper No. 5648

July 1996

JEL Nos. G30, L13, J33

We argue that strategic interactions between firms in an oligopoly can explain the puzzling lack of high-powered incentives in executive compensation contracts written by shareholders whose objective is to maximize the value of their shares. We derive the optimal compensation contracts for managers, and demonstrate that the use of high-powered incentives will be limited by the need to soften product market competition. In particular, when managers can be compensated based on their own and their rivals' performance, there will be an inverse relationship between the magnitude of high-powered incentives and the degree of competition in the industry. More competitive industries are characterized by weaker pay-performance incentives. Empirically, we find strong evidence of this inverse relationship in the compensation of executives in the United States. Our econometric results are not consistent with alternative theories of the effect of competition on executive compensation. We conclude that strategic considerations can preclude the use of high-powered incentives, in contrast to the predictions of the standard principal-agent model.

The Litigious Plaintiff Hypothesis: Case Selection and Resolution

**Theodore Eisenberg and
Henry S. Farber**

NBER Working Paper No. 5649

July 1996

JEL No. K41

Law and Economics, Labor Studies

A central feature of the litigation process that affects case outcomes is the selection of cases for litigation. In this study, we present a theoretical framework for understanding the operation of this suit selection process and its relationship to the underlying distribution of potential claims and claimants. We implement the model empirically by assuming that individuals vary more in their litigiousness (inverse costs of litigation) than corporations do. This assumption, coupled with the case selection process we present, yields clear predictions on trial rates as a function of whether the plaintiff and defendant were individuals or corporations. The model also yields a prediction on the plaintiff's win rate in lawsuits as a function of the plaintiff's identity. Our empirical analysis, using data on over 200,000 federal civil litigations, yields results that are generally consistent with the theory. Lawsuits in which the plaintiff is an individual are found to have higher trial rates and lower plaintiff win rates.

The Aftermath of Appreciations

**Ilan Goldfajn and
Rodrigo O. Valdés**

NBER Working Paper No. 5650

July 1996

JEL No. F31

International Finance and
Macroeconomics

This paper empirically analyzes a broad range of episodes of real exchange rate appreciation. We identify the cases after compiling a large sample of monthly multilateral real exchange rates from 1960 to 1994. There are two objectives:

first, we study the *dynamics* of appreciations, avoiding the sample selection of exclusively analyzing the crisis (or devaluation) cases. Second, we analyze the mechanism by which overvaluations are corrected. In particular, we are interested in the proportion of the reversions that occur through nominal devaluations, rather than cumulative inflation differentials. We calculate the probability of undoing appreciations without nominal depreciations for various degrees of misalignment. Our overall conclusion is that it is very unlikely that large and medium appreciation can be undone without nominal devaluations.

Stepping-Stone Mobility

**Boyan Jovanovic and
Yaw Nyarko**

NBER Working Paper No. 5651

July 1996

JEL No. J6

Productivity

People at the top of an occupational ladder earn more partly because they have spent time on lower rungs, where they have learned something. But what precisely do they learn? There are two contrasting views: first, the "Bandit" model assumes that people are different; that experience reveals their characteristics; and that, consequently, an occupational switch can result. Second, in our "Stepping-Stone" model, experience raises a worker's productivity on a *given* task, and the acquired skill can be transferred in part to other occupations, and this prompts movement. Safe activities (in which mistakes destroy less output) are a natural training ground.

The Effects of Tax-Law Changes on Prices in the Property-Casualty Insurance Industry

**David F. Bradford and
Kyle D. Logue**

NBER Working Paper No. 5652

July 1996

Public Economics

During the 1980s, the federal income tax treatment of property-casualty insurers and their policyholders underwent several important changes, the most significant of which occurred in 1986. This paper develops theoretical predictions for how these changes should have affected the equilibrium prices of property-casualty insurance policies, and explores the extent to which the theoretical predictions are reflected in data on industry experience. The paper is devoted mainly to a careful specification of the income tax rules, and to deriving the connection between predictions about simple forms of insurance policy and industry data on "premiums earned." Although the predicted impact of the changes in the tax rules enacted in 1986 translates into a tax on premiums (net of the cost of acquisition) of up to 13 percent (on medical malpractice—the longest tail-line of insurance—in 1987), it is small relative to the variability of the actual loss experience.

Personal Bankruptcy and Credit Supply and Demand

**Reint Gropp, John Karl Scholz,
and Michelle White**

NBER Working Paper No. 5653

July 1996

Public Economics

This paper examines how personal bankruptcy and bankruptcy exemptions affect the supply of, and demand for, credit. While gen-

erous state-level bankruptcy exemptions probably are viewed by most policymakers as benefiting borrowers who are less well-off, data from the 1983 Survey of Consumer Finances suggest that they increase the amount of credit held by high-asset households and reduce the availability and amount of credit to low-asset household (conditioning on observable characteristics). We also find that interest rates on automobile loans for low-asset households are higher in high-exemption states. Thus, bankruptcy exemptions redistribute credit toward borrowers with high assets.

Convergence to the Law of One Price Without Trade Barriers or Currency Fluctuations

David C. Parsley and Shang-Jin Wei

NBER Working Paper No. 5654

July 1996

International Finance and Macroeconomics

Using a panel of 51 prices from 48 cities in the United States, we provide an upper bound estimate of the rate of convergence to purchasing power parity. We find convergence rates substantially higher than typically found in cross-country data. We investigate some potentially serious biases induced by i.i.d. measurement errors in the data, and find our estimates to be robust to these potential biases. We also present evidence that convergence occurs faster for larger price differences. Finally, we find that rates of convergence are slower for cities farther apart. However, our estimates suggest that distance alone can account for only a small portion of the much slower convergence rates across national borders.

The Effects of Financial Education in the Workplace: Evidence from a Survey of Employers

Patrick J. Bayer, B. Douglas Bernheim, and John Karl Scholz

NBER Working Paper No. 5655

July 1996

JEL Nos. H31, I31

Aging, Public Economics

We examine the effects of education on financial decisionmaking skills by identifying an interesting source of variation in pertinent training. During the 1990s, an increasing number of individuals were exposed to financial education programs provided by their employers. If, as some have argued, low saving frequently results from a failure to appreciate economic vulnerabilities, then education of this form could have a powerful effect on behavior. We analyze these programs using a previously unexploited survey of employers. We find that both participation in and contributions to voluntary savings plans are significantly higher when employers offer retirement planning seminars. The effect is typically much stronger for employees who are not highly compensated than for those who are. The frequency of seminars is a particularly important correlate of behavior. We are unable to detect any effects of written materials, such as newsletters and summary plan descriptions, regardless of seminar frequency. We also present evidence on other determinants of plan activity.

Technology and Jobs: Secular Changes and Cyclical Dynamics

Timothy Dunne, John C. Haltiwanger, and Kenneth R. Troske

NBER Working Paper No. 5656

July 1996

JEL Nos. E2, J2, L2, O3

Economic Fluctuations and Growth

We exploit plant-level data for U.S. manufacturing for the 1970s and 1980s to explore the connections between changes in technology and the structure of employment and wages. We focus on the nonproduction share of labor (measured alternatively by employment and wages) as the variable of interest. Our main findings are: 1) aggregate changes in the nonproduction of labor share at annual and longer frequencies are dominated by within-plant changes; 2) the distribution of annual within-plant changes spikes at zero, has tremendous heterogeneity, and fat left and right tails; 3) within-plant secular changes are concentrated in recessions; and 4) while observable indicators of changes in technology account for a significant fraction of the secular increase in the average nonproduction share of labor, unobservable factors account for most of the secular increase, most of the cyclical variation, and most of the cross-sectional heterogeneity.

The Origins of Technology-Skill Complementarity

Claudia Goldin and Lawrence F. Katz

NBER Working Paper No. 5657

July 1996

JEL Nos. J0, N0

Development of the American Economy, Labor Studies

Current concern with relationships among particular technologies, capital, and the wage structure motivates this study of the origins of technology-skill complementarity in manufacturing. We offer evidence of the existence of technology-skill and capital-skill

(relative) complementarities from 1909 to 1929, and suggest that they were associated with continuous-process and batch methods and with the adoption of electric motors. Industries that used more capital per worker and a greater proportion of their horsepower in the form of purchased electricity employed relatively more educated blue collar workers in 1940 and paid their blue collar workers substantially more from 1909 to 1929. We also infer capital-skill complementarity using the wage-bill for nonproduction workers, and find that the relationship was as large from 1909–19 as it has been recently. Finally, we link our findings to those on the high school movement (1910 to 1940). The rapid increase in the supply of skills from 1910 to 1940 may have prevented rising inequality with technological change.

Inequality and Growth

Roland Bénabou

NBER Working Paper No. 5658

July 1996

JEL Nos. O11, D31, E62

Economic Fluctuations and Growth

Using two unifying models and an empirical exercise, this paper presents and extends the main theories linking income distribution and growth, as well as the relevant empirical evidence. The first model integrates the political economy and imperfect capital markets theories. It allows for explicit departures from perfect democracy and embodies the trade-off between the growth costs and benefits of redistribution through taxes, land reform, or public schooling: such policies simultaneously depress savings incentives and ameliorate the wealth constraints that impede investment by the poor.

The second model is a growth

version of the prisoner's dilemma, which captures the essence of theories in which sociopolitical conflict reduces the security of property rights, thereby discouraging accumulation. The economy's growth rate falls with interest groups' rent-seeking abilities, as well as with the gap between rich and poor. It is not income inequality per se that matters, however, but inequality in the relative distribution of earnings and political power. For each of the three channels of political economy, capital markets, and social conflict, I survey the empirical evidence and discuss it in conjunction with the theoretical analysis. Finally, the possibility of multiple steady states leads me to raise and take up a new empirical issue: are cross-country differences in inequality permanent, or gradually narrowing? Equivalently, is there convergence not only in first moments (GDP per capita) but also in distribution?

Growth Cycles

**George Evans,
Seppo Honkapohja, and
Paul M. Romer**

NBER Working Paper No. 5659

July 1996

JEL Nos. E3, O4

Economic Fluctuations and Growth

We construct a rational expectations model in which aggregate growth alternates between a low and high state. When all agents expect growth to be slow, the returns on investment are low, and little investment takes place. This slows growth and confirms the prediction that the returns on investment will be low. But if agents expect fast growth, then investment is high, returns are high, and growth is rapid. This expectational indeterminacy is induced by complementarity between different types of capital

goods. In a growth cycle, there are stochastic shifts between high- and low-growth states, and agents take full account of these transitions. The rules that agents need to form rational expectations in this equilibrium are simple. The equilibrium with growth cycles is stable under the dynamics implied by a correspondingly simple learning rule.

Loan Commitments and Optimal Monetary Policy

Michael Woodford

NBER Working Paper No. 5660

July 1996

JEL No. E50

Monetary Economics

With loan commitments negotiated in advance, the use of "tight money" to restrain nominal spending has asymmetric effects on different categories of borrowers. This can reduce efficiency, even though it stabilizes aggregate demand. I illustrate this in the context of an equilibrium model of financial intermediation with loan commitments, in which monetary policy is characterized by a supply curve for reserves on the part of the central bank in an interbank market.

If demand uncertainty relates primarily to the intensity of demand by each borrower with no difference in the degree of cyclical-ity of individual borrowers' demands, then an inelastic supply of reserves by the central bank is optimal, because it stabilizes aggregate demand and, as a result, increases average capacity utilization. But if demand uncertainty relates primarily to the number of borrowers rather than to each one's demand for credit, then an interest rate smoothing policy is optimal, because it eliminates inefficient rationing of credit in high-demand states.

Law and Finance

**Rafael La Porta,
Florencio Lopez-de-Silanes,
Andrei Shleifer, and
Robert W. Vishny**

NBER Working Paper No. 5661

July 1996

Corporate Finance

This paper examines legal rules covering protection of corporate shareholders and creditors, the origin of those rules, and the quality of their enforcement in 49 countries. The results show that common law countries generally have the best, and French civil law countries the worst, legal protection of investors, with German and Scandinavian civil law countries located in the middle. We also find that concentration of ownership of shares in the largest public companies is related negatively to investor protections, consistent with the hypothesis that small, diversified shareholders are unlikely to be important in countries that fail to protect their rights.

U.S. Steel's Acquisition of the Great Northern Ore Properties: Vertical Foreclosure or Efficient Contractual Governance?

**Joseph C. Mullin and
Wallace P. Mullin**

NBER Working Paper No. 5662

July 1996

JEL Nos. L2, L4

Industrial Organization

This paper examines U.S. Steel's acquisition by long-term lease of the iron ore properties of the Great Northern Railway. This 1906 transaction, which significantly increased U.S. Steel's already substantial ore holdings, has been characterized by contemporary observers and modern economists as an example of vertical foreclosure.

We present quantitative and qualitative evidence to support an alternative view: that the lease generated a net efficiency gain, resulting in lower steel prices, because it promoted relationship-specific investment in the exploitation of the ore properties. Quantitatively, we examine the stock market reactions of U.S. Steel, the Great Northern Railway, steel industry rivals, and the railroads, a major steel customer, to the announcement of the lease signing. Strikingly, the railroads had a significant positive excess return. Qualitatively, we examine the terms of the lease and the performance of the parties, to document the role of the lease in encouraging relationship-specific investment.

Historical Factors in Long-Run Growth

The Paradox of Planning in World War II

Hugh Rockoff

NBER Historical Paper No. 83

May 1996

JEL No. N42

According to the standard accounts of the mobilization of resources in the United States during World War II, things went badly in the beginning because the agencies in charge were not given sufficient authority and were mismanaged. But then in 1943, the story continues, the War Production Board installed the famous Controlled Materials Plan, which solved the major problems and turned disaster into triumph. However, a reexamination of the plan in light of information on munitions production reveals that it was too little and too late to explain

the success of the mobilization. One implication is that pecuniary incentives may have played a larger role than has been recognized.

America's Only Peacetime Inflation: The 1970s

J. Bradford De Long

NBER Historical Paper No. 84

May 1996

JEL Nos. E5, N1, N4

Monetary Economics

The 1970s were America's only peacetime inflation, as uncertainty about prices made every business decision a speculation on monetary policy. In magnitude, the total rise in the price level to the 5-to-10 percent per year range in the 1970s was as large as the jumps in prices from the major wars of this century.

The truest cause of the 1970s inflation was the shadow of the Great Depression. The memory left by the Depression predisposed the left and center to think that any unemployment was too much, and eliminated any mandate the Federal Reserve might have had for controlling inflation by risking unemployment.

The Federal Reserve gained, or regained, its mandate to control inflation at the risk of unemployment during the 1970s as discontent built over that decade's inflation. It is hard to see how the Federal Reserve could have acquired such a mandate without such an unpleasant lesson as the inflation of the 1970s.

Thus the memory of the Great Depression meant that the United States was highly likely to suffer an inflation like the 1970s in the post-World War II period—maybe not as long, and maybe not in that particular decade, but nevertheless an inflation of recognizably the same *genus*.

The Use of the Census to Estimate Childhood Mortality: Comparisons from the 1900 and 1910 United States Census Public Use Samples

Michael R. Haines and Samuel H. Preston

NBER Historical Paper No. 85
May 1996

We estimate child mortality by race and nativity for the United States as a whole and the Death Registration Area, based on the public use microsamples of the 1900 and 1910 Censuses. We then compare these indirect estimates to mortality rates and parameters based on published Census and vital statistics data. The federal Censuses of 1900 and 1910 both asked adult women about children ever born and children surviving; when tabulated by age or marriage duration of women, the responses can be used to estimate the probabilities of children dying at various ages up to 25.

This paper applies the basic indirect age and marriage duration methods, as well as a method involving the backward projection of the age distribution of surviving own-children of younger adult women. The results correspond reasonably well to life tables calculated from aggregated Census and vital statistics for the total white, native white, and foreign-born white populations. The results are less definite for the African-American population, but it does appear that mortality in that population was substantially better than was indicated by the widely cited Glover life tables for 1900/02, 1901/10, and 1909/11 for the original Death Registration Area of 1900. Overall, however, it appears that calculated life tables from published vital statistics and Census populations for

the Death Registration Areas of 1900 and 1910 describe the remainder of the population relatively well. (An appendix to the paper provides examples of the application of the basic indirect techniques of mortality estimation, as well as the calculation of a mortality index that can be used with both individual-level and grouped data.)

Strikebreaking and the Labor Market in the United States, 1881-94

Joshua L. Rosenbloom

NBER Historical Paper No. 86
May 1996
JEL Nos. N31, J52

Improvements in transportation and communication combined with technological changes in key manufacturing industries substantially increased competitive pressures in U.S. labor markets during the last half of the nineteenth century. One manifestation of these changes was the widespread use of strikebreakers. In this paper I examine the extent and pattern of strikebreaking in the United States using data from a sample of over 2000 individual strikes between 1881 and 1894 drawn from reports compiled by the U.S. Commissioner of Labor. Consistent with other evidence of increasing geographic integration at this time, I find that the use of strikebreakers did not vary substantially across regions or by city size. On the other hand, I find that employers in smaller cities and in regions other than the Northeast were more likely to have to turn to replacements recruited at a distance, underscoring the important role that employer recruitment played in establishing an integrated labor market. Pronounced variations in the likelihood of strikebreaking across industries suggest, however, that the impact of in-

creasing integration differed for different groups of workers and employers. Finally, the strike data confirm the importance of labor market integration on the outcomes of labor conflict during this period. After controlling for other strike characteristics, I find that the use of strikebreakers had a large and negative impact on workers' ability to win strikes.

Health, Height, and Welfare: Britain, 1700-1980

Roderick Floud and Bernard Harris

NBER Historical Paper No. 87
May 1996

This paper reviews the evidence regarding the main trends in the height of the British population since the early eighteenth century. We argue that the average heights of successive birth cohorts of British males increased slowly between the middle of the eighteenth century and the first quarter of the nineteenth century. Average heights fell during the second quarter of the nineteenth century, before rising beginning in the 1850s. We support this analysis with an examination of the main trends in children's heights during the twentieth century. We then compare our findings with the results of an alternative method of measuring human welfare: a modified version of the United Nations Human Development Index. The main trends in human development reinforce the conclusions drawn from our own interpretation of the anthropometric evidence.

The Entry into the U.S. Labor Market of Antebellum European Immigrants, 1840-60

Joseph P. Ferrie

NBER Historical Paper No. 88
June 1996

JEL Nos. N3, J6

This study examines the occupational mobility of antebellum immigrants as they entered the United States. White-collar, skilled, and semiskilled immigrants left unskilled jobs more rapidly after their arrival than farmers and unskilled workers did. British and German immigrants fared better than the Irish; literate immigrants in rapidly growing counties and places with many immigrants fared best. These findings have implications for: the accuracy of estimates of immigrant occupational mobility; the size of the human capital transfer resulting from antebellum immigration; and the causes of the difficulty experienced by some immigrant groups in transferring their skills to the United States.

Technical Papers

Inferences from Parametric and Nonparametric Covariance Matrix Estimation Procedures

Wouter J. den Haan and Andrew Levin

NBER Technical Paper No. 195

May 1996

JEL Nos. C12, C14

Economic Fluctuations and Growth

In this paper, we propose a parametric spectral estimation procedure for constructing heteroskedasticity and autocorrelation consistent (HAC) covariance matrixes. We establish the consistency of this procedure under very general conditions similar to those considered in previous research, and we demonstrate that the parametric estimator converges at a faster rate than the

kernel-based estimators proposed by Andrews and Monahan (1992) and Newey and West (1994). In finite samples, our Monte Carlo experiments indicate that the parametric estimator matches, and in some cases greatly exceeds, the performance of the prewhitened kernel estimator proposed by Andrews and Monahan. These simulation experiments illustrate several important limitations of nonparametric HAC estimation procedures, and highlight the advantages of explicitly modeling the temporal properties of the error terms.

Generating Nonstandard Multivariate Distributions with an Application to Mismeasurement in the CPI

Matthew D. Shapiro and David W. Wilcox

NBER Technical Paper No. 196

May 1996

JEL Nos. C15, C43, E31

Monetary Economics, Productivity

This paper shows how to generate the joint distribution of correlated random variables with specified marginal distributions. For cases in which the marginal distributions are either normal or lognormal, it shows how to calculate analytically the correlation of the underlying normal distributions to induce the desired correlation between the variables. It also provides a method for calculating the joint distribution in the case of arbitrary marginal distributions.

The paper applies the technique to calculating the distribution of the overall bias in the Consumer Price Index. The technique also should be applicable to estimation by simulated moments or simulated likelihoods, and to Monte Carlo analysis.

A Practitioner's Guide to Robust Covariance Matrix Estimation

Wouter J. den Haan and Andrew T. Levin

NBER Technical Paper No. 197

June 1996

JEL Nos. C12, C14

Economic Fluctuations and Growth

This paper analyzes kernel-based and parametric spectral estimation procedures for constructing heteroskedasticity and autocorrelation-consistent (HAC) covariance matrixes, and provides guidelines for effective implementation of these procedures. To implement a kernel-based procedure, the practitioner must choose a particular kernel, a bandwidth selection method, and a prewhitening filter. To implement a parametric procedure, the practitioner must choose a class of admissible models and a criterion for selecting a particular model within this class. Simulation experiments indicate that these choices can have important implications for the accuracy of inferences based on the estimated HAC covariance matrix. Thus, rather than viewing any of these procedures as fully "automatic," there must be a combination of diagnostic statistics and common sense in the practical applications.

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