Backus, Foresi, and **Zin** explore the practitioners' methodology of choosing time-dependent parameters that can fit a bond model to selected asset prices. They show that this can lead to systematic mispricing of some assets. For example, the Black–Derman–Toy model is likely to overprice call options on long bonds when interest rates exhibit mean reversion. This mispricing can be exploited, even when no other traders offer the mispriced assets. The authors argue more generally that time-dependent parameters cannot substitute for sound fundamentals.

Bekaert and **Harvey** propose a conditional measure of integration of the capital market that allows characterization of both the cross section and the time series of expected returns in developed and emerging markets. Their measure allows them to describe expected returns in countries that are segmented from world capital markets in one part of the sample and become integrated later in the sample. Their results suggest that a number of emerging markets exhibit time-varying integration. Interestingly, some markets appear to be more integrated than one might expect based on prior knowledge of investment restrictions. Other markets appear segmented, even though foreigners have relatively free access to their capital markets.

Allen and **Karjalainen** use a genetic algorithm to find technical trading rules for Standard & Poor's Composite Stock Index in 1963–89. Compared to a simple buy-and-hold strategy, these trading rules led to positive excess returns in the out-of-sample test period of 1970–89. In addition, the rules appear to reduce the variability of the returns. The authors also find that the excess returns are both statistically and economically significant, even when transaction costs are taken into account.

Andersen and **Bollerslev** study the intraday seasonality in the volatility of returns in foreign exchange and equity markets. They show that pervasive seasonal patterns have a strong impact on the dynamic properties of high-frequency returns. Consequently, traditional time-series models developed for the analysis of daily or lower-frequency returns turn out to be grossly inadequate, and may give rise to very misleading conclusions when estimated directly on raw high-frequency returns. The explicit seasonal modeling procedure that the authors develop sets the stage for formal integration of standard volatility models with market microstructure variables. This allows for a more comprehensive empirical investigation of the fundamental determinants behind the volatility clustering phenomenon.

Grossman and **Zhou** consider a financial market with two types of risk managers: insurers and noninsurers. A noninsurer's objective is to maximize the expected utility of his terminal wealth; an insurer's objective is the same, but is subject to the constraint that his portfolio wealth never fall below a certain percentage of his initial capital (the floor). The authors find that the equilibrium price is lower and the Sharpe ratio is higher with insurers than without them in states where the insurers suffer losses. Good news lowers the Sharpe ratio, while bad news raises it. Price volatility also is higher in the presence of insurers than it is in the absence of insurers. When good news comes, volatility falls; bad news raises volatility. When the price goes up, insurers buy the risky asset; a fall in the price will prompt the insurers to sell it. The changes in the price level, Sharpe ratio, and volatility all are most dramatic around the point at which the wealth of the insurers is expected to equal the floor.

Also attending the meeting were: Andrew B. Abel, David S. Bates, Francis X. Diebold, Janice Eberly, Karen K. Lewis, Robert F. Stambaugh, and Stephen P. Zeldes, NBER and University of Pennsylvania; Marshall Blume, Urban Jermann, and Krishna Ramaswamy, University of Pennsylvania; and René M. Stulz, NBER and Ohio State University.

Labor Studies Program Meeting

About 40 members and guests of the NBER's Program in Labor Studies convened in Cambridge on November 4 for their fall meeting. The program, organized by Lawrence F. Katz of NBER and Harvard University, was:

William Evans and
Edward B. Montgomery, NBER and University of Maryland, "Education and Health: Where There's Smoke There's an Instrument" (NBER Working Paper No. 4949)

Caroline Minter Hoxby, NBER and Harvard University, "Does Competition Among Public Schools Benefit Students and Taxpayers?" (NBER Working Paper No. 4979)

James J. Heckman, NBER and University of Chicago, and **Jeffrey Smith,** University of Chicago, "Ashenfelter's Dip and

the Determinants of Participation in a Social Program: Separating the Impact of Administrative Rules and Individual Behavior"
Eli Berman, NBER and Boston University;
Stephen Machin, London School of Economics; and
John Bound, University of Michigan, "Implications of Skill-Based Technological Change: International Evidence"
Derek Neal, NBER and University of Chicago, and
William Johnson, University of Virginia, "The Role of Pre-Market Factors in Black–White Wage Differences"

Whether an individual smoked at age 18 is strongly correlated with years of education. **Evans** and **Montgomery** show that the smoking/education link varies systematically across age groups, and that smoking also is correlated with other life decisions, such as homeownership. Their results hold in three different datasets, and for both males and females.

Hoxby finds that making it easier for parents to choose among public schools for their children leads to better performance by students relative to school costs. Areas with greater opportunities for choice among public schools have lower spending per pupil, lower teacher salaries, and larger class sizes. However, the same areas have on average better student performance, as measured by educational attainment, wages, and test scores. With school choice, improvements in student performance are concentrated among white non-Hispanics, males, and students who have a parent with at least a high school degree, but performance does not decline among other students. Finally, in areas where choice among public schools is easier, a smaller share of students attend private schools.

The average earnings of participants in government training programs decline during the period prior to participation. **Heckman** and **Smith** use unique data from the recent experimental evaluation of the training programs funded under the Job Training Partnership Act to learn more about the dip, and to identify the participants' decisions that underlie it. They show that the drop in mean earnings is transitory for all demographic groups: for most groups, mean earnings exceed their pre-dip level within 18 months The dip in mean earnings results from the overrepresentation of recent job losers among training program participants.

Berman, Machin, and **Bound** document changes in employment structure in the manufacturing sectors of a number of developed countries between 1970 and 1990. They find that in (almost) all cases, there have been shifts toward increased use of relatively skilled workers. This increased use of skilled labor is much more consistent with technology-based arguments than with explanations based on increased international trade. Most of the observed shifts in skill structure occur within industries.

Neal and **Johnson** use scores on the Armed Forces Qualifying Test, for persons who took the test at age 18 or younger, as a measure of skill. They have independent evidence that this measure is racially unbiased. They show that differences in family background and school environment contribute to the racial gap in test scores.

Health Economists Meet in Cambridge

A meeting of the NBER's Program on Health Care, organized by Brigitte C. Madrian of the NBER and Harvard University, took place in Cambridge on November 7. The papers discussed were:

Jack Needleman, Harvard University, "Cost Shifting or Cost Cutting? Hospital Responses to High Uncompensated Care"
Discussant
Richard G. Frank, NBER and Harvard University

Daniel Kessler, NBER and Stanford University, and
Mark McClellan, NBER and Harvard University, "Do Doctors Practice Defensive Medicine?"
Discussant:
Judith Hellerstein, NBER and Northwestern University

Paul J. Gertler, NBER and The Rand Corporation, and
Roland Sturm, The Rand Corporation, "Using Private Health Insurance to Reduce and Better Target Public Expenditures"
David M. Cutler, NBER and Harvard University, and
Jonathan Gruber, NBER and MIT, "Does Public Insurance Crowd Out Private Insurance?"
Discussant for both papers:
Janet Currie, NBER and University of California, Los Angeles

Needleman examines the evidence for cost shifting and cost cutting by nonprofit and for-profit hospitals in California between 1986 and 1990. He finds that nonprofit, but not for-profit, hospitals did shift costs from fully paying to nonpaying patients during this period. There is no substantial evidence of cost cutting by hospitals with high uncompensated care, though, and no evidence of economic rents among nonprofit hospitals. Further, the ability of nonprofit hospitals in California to shift costs appears to have declined between 1986 and 1990, as did the ability of for-profit hospitals to charge higher prices than nonprofits. Needleman's analysis suggests that one "service" provided by nonprofits is lower prices. Nonprofits increase prices to private payers in the face of high uncompensated care, but otherwise their prices would remain below those of comparable for-profits for all but a small group of hospitals with very high uncompensated care loads. The value of these lower prices approximates the taxes that nonprofits might pay if they priced and were taxed as for-profits.

If the fear of liability drives health care providers to administer treatments that have minimal medical benefit, then the liability system may impose social costs far in excess of the volume of transfers it administers. Using a unique longitudinal dataset that matches information on state tort laws with inpatient records collected on elderly Medicare recipients treated for a heart attack in 1989, **Kessler** and **McClellan** show that doctors do practice defensive medicine. Patients from states with relatively lower levels of medical malpractice tort liability receive less intensive treatment, but suffer no worse health outcomes, than patients in other states, they find.

Using data from Jamaica, **Gertler** and **Sturm** estimate the existing demand for public and private medical care, and the likely impact on demand of expanding health insurance among wage earners. They calculate that expanded insurance would result in a saving of about 16 percent of public expenditures for curative services and about 14 percent of public expenditures for preventive services. In addition, Gertler and Sturm estimate that insurance would increase the share of public expenditures captured by the poor by about 15 percent for preventive services and about 27 percent for curative services. In summary, they find, expanding health insurance among the nonpoor in Jamaica will reduce public expenditures on health care substantially, dramatically improve the efficiency with which public expenditures are targeted to the poor, and increase access to medical care.

Extending subsidized health insurance coverage to certain population groups could cost substantially more than anticipated, because public coverage would be substituted for existing private insurance. Using the experience of large expansions of the Medicaid program in the late 1980s and early 1990s—which made almost one-third of children and over 40 percent of pregnant women eligible for Medicaid coverage—**Cutler** and **Gruber** observe a reduction in private insurance coverage among children, women, and workers who cover them as dependents. They estimate that roughly one-third of the increase in Medicaid coverage in this era can be accounted for by declines in private insurance coverage.

Public Economics Program Meeting

More than 40 members of the NBER's Program in Public Economics met in Cambridge on November 17 and 18. Program Director James M. Poterba, also of MIT, organized this agenda:

Hans-Werner Sinn, NBER and University of Munich, "A Theory of the Welfare State" (NBER Working Paper No. 4856)

Discussant:
Richard J. Zeckhauser, NBER and Harvard University

Caroline Minter Hoxby, Harvard University, "Does Competition Among Public Schools Benefit Students and Taxpayers?" (NBER Working Paper No. 4979. See "Labor Studies Program Meeting" earlier in this section.)

Discussant:
Anne C. Case, NBER and Princeton University

David M. Cutler and
Brigitte C. Madrian, NBER and Harvard University, "Labor Market Responses to Rising Health Insurance Costs"

Discussant:
Kevin Lang, Boston University

Joel B. Slemrod, NBER and University of Michigan, "A General Model of the Behavioral Response to Taxation"

Discussant:
John Whalley, NBER and University of Western Ontario

J. Vernon Henderson, NBER and Brown University, "The Effect of Regulatory Activity on Air Quality and on Industrial Location"
Discussant:
Leslie E. Papke, NBER and Michigan State University

James J. Heckman, NBER and University of Chicago, and **Theresa Devine,** University of Chicago, "The Economics of Eligibility Rules for a Social Program: A Study of the Job Training Partnership Act"
Discussant:
Jonathan Gruber, NBER and MIT

Jagadeesh Gokhale, Federal Reserve Bank of Cleveland; **Laurence J. Kotlikoff,** NBER and Boston University; and **John Sabelhaus,** Urban Institute, "Understanding the Postwar Decline in U.S. Saving"
Discussant:
Andrew Samwick, NBER and Dartmouth College

Sinn studies the trade-off between average income and inequality in an optimal welfare state. He shows that because of constant returns to risktaking, more redistribution could result in more, not less, inequality. In general, optimal taxation either will imply this paradox, or that the economy is operating at a point where more inequality implies a lower average income.

Between 1980 and 1990, health insurance costs per covered worker doubled in real terms, from $2000 per worker to $4000. **Cutler** and **Madrian** find that, over the same time, hours of work increased for those with health insurance compared to those without health insurance by about 0.8 per week. This represents an increase of 1.5 to 2 percent in labor input over the time period. Further, hours increased more rapidly in industries with high health insurance costs than in industries with low health insurance costs. One explanation for this is that health insurance is a proxy for differences in skills among individuals. Using data from the 1984–8 panels of the Survey of Income and Program Participation, Cutler and Madrian also show that the increase in hours worked appears to be caused by increases in health insurance costs, rather than other factors.

Slemrod develops a simple and general model of the behavioral response to income taxation, allowing the individual to choose both labor supply and tax-avoiding activities. He draws implications of the model for the study of labor supply, and for the incidence and efficiency of taxation.

Henderson uses three panel datasets to investigate the relationship between regulation of ground level ozone and changes in both air quality and industrial location patterns. For 1977–87, he finds that: 1) a change in status within a county in terms of national air quality standards leads to a worsening of air quality, as counties and states relax enforcement; 2) counties in states that typically spend more (controlling for the level and composition of economic activity) on pollution abatement have cleaner air; and 3) polluting industries tend to locate in counties that have attained national air quality standards. Further, in heavily polluted and congested areas, economic activity over the day has been rescheduled to dampen the height of daily ozone peaks.

Heckman and **Devine** examine the structure and consequences of eligibility rules for a major social program: the Job Training Partnership Act. They find that variation over time and by location in written eligibility rules has relatively minor effects on the size and composition of the eligible population, but that stable rules have important consequences. Stable eligibility rules discriminate on the basis of income sources and family status.

Gokhale, Kotlikoff, and **Sabelhaus** find that the decline in U.S. saving over the past two decades or so can be traced to two factors: the redistribution of resources toward older generations, which consume much of their incomes, from younger ones, which consume very little; and increases in the desire for consumption among the elderly. Most of the redistribution to the elderly reflects the growth in Social Security, Medicare, and Medicaid benefits. The increase in the elderly's desire to consume also may reflect government policy, especially the fact that Social Security benefits paid are in the form of annuities, and Medicare and Medicaid benefits are provided directly as medical goods and services.

The Well-Being of Children

Around 30 members and guests of the NBER's Project on the Well-Being of Children met at the Bureau's Cambridge office on December 5. Lawrence F. Katz, NBER and Harvard University, organized this program:

Joshua D. Angrist, NBER and Hebrew University, and
Victor Lavy, Hebrew University, "Teenage Childbearing, Childhood Disabilities, and Progress in School"

Sanders Korenman, NBER and University of Minnesota, and
Christopher Winship, Harvard University, "IQ Versus Family Background: A Reanalysis of *The Bell Curve*"

Michael A. Boozer, Yale University, and
Cecilia E. Rouse, NBER and Russell Sage Foundation, "Black–White Differences in Class Size Revisited"

Charles F. Manski, NBER and University of Wisconsin, and
Jeff Dominitz, University of Michigan, "Eliciting Student Expectations on the Returns to Schooling" (NBER Working Paper No. 4936)

Angrist and **Lavy** use special disability questions from the school enrollment supplement to the 1992 Current Population Survey to estimate the relationship between maternal age at birth, children's disability status, and school progress. They find little association between maternal age at birth and children's disability status. But there is a strong association between disability and grade repetition, and between maternal age at birth and grade repetition, conditional on disability status. The children of young mothers are much more likely to repeat one or more grades than other children. Also, having a father in the household is associated with lower prevalence of disability and fewer grade repetitions. However, both of these effects appear to be explained almost entirely by higher household incomes in two-parent families.

Korenman and **Winship** present preliminary results from their project on IQ versus family background, a reanalysis of Herrnstein and Murray's *The Bell Curve.* They reach three tentative and preliminary conclusions. In general, the estimated effects of IQ on a youth's economic success do not appear to be biased by omitted factors in family background. However, the effects of IQ appear to be biased upward, and the effects of parents' socioeconomic status biased downward, in Herrnstein and Murray's work. They may have greatly understated the influence of family background on later income, therefore leaving a false impression that family background is less important to income and behavior than IQ is.

For their study, **Boozer** and **Rouse** rely on two datasets that measure overall pupil–teacher ratios and individual class sizes within schools: a survey that they conducted on 500 New Jersey teachers from all grade levels; and the National Longitudinal Survey of eighth graders in 1988. They find that both the pupil–teacher ratio and average class size may obscure important variation in class size within schools. Compensatory education classes are small, and black students are more likely than other students to be assigned to those classes. This reduces the potential racial difference in average class size. However, the authors find that in general, black students are both in schools with larger average class sizes, and are in larger classes within schools.

Manski and **Dominitz** design and apply an interactive computer-administered personal interview survey that asks high school students and college undergraduates what they would expect to earn if they were to complete different levels of schooling. The authors find that the respondents, even as young as high school sophomores, are both willing and able to answer meaningfully. Despite wide variation, there is a common belief that the returns to a college education are positive, that earnings rise between ages 30 and 40, and that one's own future earnings are rather uncertain. Moreover, respondents tend to overestimate the current degree of earnings inequality in American society.

Behavioral Macroeconomics

Thirty-five economists met at the NBER in Cambridge on December 9 to discuss papers on behavioral macroeconomics. George A. Akerlof, NBER and University of California, Berkeley, and Robert J. Shiller, NBER and Yale University, organized this program:

Truman Bewley, Yale University, "A Field Study on Downward Wage Rigidity"
Discussant: Robert Solow, MIT

David Laibson, Harvard University, "A Cue-Theory of Consumption"
Discussant: Richard J. Zeckhauser, NBER and Harvard University

Owen A. Lamont, Princeton University, "Macroeconomic Forecasts and Microeconomic Forecasters"
Discussant: Ray C. Fair, Yale University

George A. Akerlof; Janet L. Yellen, Federal Reserve Board; and **Michael L. Katz,** University of California, Berkeley, "An Analysis of Out-of-Wedlock Childbearing in the United States"
Discussant: Richard H. Thaler, NBER and MIT

Peter A. Diamond, NBER and MIT; **Eldar Shafir,** Princeton University; and **Amos Tversky,** Stanford University, "On Money Illusion"
Discussant: N. Gregory Mankiw, NBER and Harvard University

Robert J. Shiller, and **Ryan Schneider,** Yale University, "Indices of Individual Income by Job Cluster and Education Level for Contract Settlement"
Discussant: Lawrence F. Katz, NBER and Harvard University

Bewley interviewed 334 business people, labor leaders, unemployment counselors, and management consultants to learn why wages and salaries do not decrease during recessions in response to increased unemployment. He found that employers say that they resist cutting the pay of existing employees largely out of fear that the shock of a reduced living standard, and the insult implied by lower pay, would hurt morale. Employers do not reduce the pay rates of new hires because they would resent being treated less favorably than existing employees. Bewley also finds that the unemployed usually are rejected as overqualified if they apply for jobs paying a good deal less than what they earned before they were unemployed. Employers fear that they will be discontent, will be a threat to their supervisors, or that they will leave as soon as they find better work.

Laibson constructs a model of a rational, dynamically consistent decisionmaker who responds to stimuli associated with disturbances in the past. The behavior that arises from this model is characterized by sensitivities to external cues, costly management of these cues, commitment, and impatience based on cues.

Lamont tests a cross-sectional implication of models of reputation and information revelation. He finds that older, established forecasters produce more radical forecasts. This indicates that reputational factors are at work in professional macroeconomic forecasts.

Akerlof, Yellen, and **Katz** explicitly model out-of-wedlock birth as the consequence of a sequence of decisions—about premarital sexual activity, the use of contraception, abortion in the event of pregnancy, and marriage and the use of AFDC in the event of birth. They conclude that the legalization of abortion may have had a role in decreasing the rate of shotgun marriages and increasing the rate of out-of-wedlock births.

Diamond, Shafir, and **Tversky** present the results of survey questions designed to shed light on the psychology that underlies "money illusion," regarding people's reactions to variations in inflation and prices. They propose that people often think about economic transactions both in nominal and in real terms, and suggest that money illusion arises from an interaction between these representations, which results in a bias toward a nominal evaluation.

Using data from the Panel Study of Income Dynamics, **Shiller** and **Schneider** create indexes of income for groupings of individuals. People are grouped into job clusters based on occupations and industries; the job clusters are defined so that relatively few people ever move between them. For each of the job clusters and education levels, the authors generate an income index. These indexes may be used in settlement formulas for contracts that promote income risk management.

Also attending this meeting were: William T. Dickens, NBER and Brookings Institution; William C. Brainard, Yale University; Pierre Fortin, University of Quebec, Montreal; Anil K. Kashyap, NBER and University of Chicago; James Robinson, University of Pennsylvania; Xavier Sala-i-Martin, NBER and Yale University; and Martin L. Weitzman, Harvard University.

Productivity Program Meeting

Around 30 members and guests of the NBER's Program in Productivity met in Cambridge on December 12. The program, organized by Adam B. Jaffe of the NBER and Brandeis University, was:

Iain M. Cockburn, NBER and University of British Columbia, and
Rebecca Henderson, NBER and MIT, "Fortunate Leaders or Reluctant Agents? Exploring the Evolution of Firm Heterogeneity in Pharmaceutical Research"
Discussant:
Joshua Lerner, Harvard University

James D. Adams, University of Florida, "The Demands for Factors of Production and the Pursuit of Industrial R and D"
Discussant:
Wayne B. Gray, NBER and Clark University

Judith K. Hellerstein, NBER and Northwestern University;
David Neumark, NBER and Michigan State University; and
Kenneth Troske, Center for Economic Studies, "Wages, Productivity, and Worker Characteristics"
Discussant:
Frank R. Lichtenberg, NBER and Columbia University

Eli Berman, NBER and Boston University;
John Bound, NBER and University of Michigan; and
Stephen Machin, University College, London, "Implications of Skill-Biased Technological Change: International Evidence" (see "Labor Studies Program Meeting" earlier in this section of the *NBER Reporter*)
Discussant:
Robert Z. Lawrence, NBER and Harvard University

A considerable body of empirical research suggests that many firms respond slowly, if at all, to a changing business environmental condition. Agency theorists have suggested that such apparently substandard performance may reflect a divergence between the objectives of the owners of the firm and those of the firm's managers. The organizational literature, on the other hand, argues that differences in performance and sluggish response may reflect limits on rationality of managers coupled with high information costs, the high psychological costs of change, and the importance of accountability and reproducibility in the long-term survival of firms. **Cockburn** and **Henderson** contrast these two explanations using internal firm data from a study of the productivity of pharmaceutical research. They find little support for the hypothesis that "badly managed" firms suffer from agency problems.

Adams studies the impact of industrial R and D on the composition of inputs, and the reverse impact of factor prices and factor saving on the demand for industrial R and D. He finds that total R and D is biased toward white collar labor and equipment. R and D in the same state as a plant is biased toward white collar labor more than toward equipment, while the reverse is true for firm R and D in the same applied product as the plant. (Here R and D is strongly biased toward equipment capital, but has a lesser effect on white collar labor.) Larger firms, as evidenced by the number of plants owned by the firm, spend a smaller fraction of cost on white collar labor and a larger fraction on equipment. In general, the price of equipment discourages R and D, the price of white collar labor has no effect, and prices of structures and blue collar labor encourage firm R and D. Finally, the pool of industry R and D in the same state appears to substitute for firm R and D in that state, while the pool of industry R and D in the same product appears to stimulate R and D of the firm.

Hellerstein, Neumark, and **Troske** combine U.S. data on individual workers with data on the plants in which they are employed, and compare estimates of the relative wages of different workers to estimates of their relative marginal productivities. They find that married workers are both paid more and are more productive than never-married workers. Workers who have attended college also are more productive than workers who have not, but in most cases, this productivity premium exceeds the wage premium. Although workers aged 35 to 54 are as productive as their younger counterparts, their relative wage in some cases is significantly higher than their relative productivity. The authors find no significant productivity or wage differential between black and white workers. On the other hand, women are paid significantly less than men in nearly all cases, with the wage differential estimated at between 27 and 43 percent.

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Reform, Recovery, and Growth

Reform, Recovery, and Growth, edited by Rudiger Dornbusch and Sebastian Edwards, will be available this winter from the University of Chicago Press for $60.00. This more technical sequel to the authors' ***The Macroeconomics of Populism in Latin America*** examines why some countries have recovered from the 1982 debt crisis, while others have stagnated. The papers explore the effects of structural reforms on trade liberalization, and the impact of stabilization programs on the poor in Argentina, Bolivia, Brazil, Chile, Mexico, Peru, and also Israel and Turkey.

Dornbusch is the Ford International Professor of economics at MIT and a research associate in the international finance and macroeconomics program at the NBER. Edwards is Chief Economist for Latin America and the Caribbean at the World Bank, the Henry Ford II Professor of International Business Economics at the University of California, Los Angeles, and a research associate in the international trade and investment program at the NBER.

Growth Theories in Light of the East Asian Experience

Growth Theories in Light of the East Asian Experience (NBER–East Asia Seminar on Economics, Volume 4) will be available from the University of Chicago Press in January. This volume analyzes the phenomenal growth of the last few decades in the newly industrializing countries (NICs) in East Asia. It examines the outward-orientation (in contrast to closing and protecting their home markets, as prescribed by earlier development economists) adopted by the NICs, which has fostered growth through exporting. The authors also look at the supportive role of government policy vis-à-vis trade, exchange rates, and the accumulation and promotion of physical and human capital.

The volume begins with an introduction and two overview papers, continues with case studies of the specific experiences of China, Taiwan, Korea, and Japan, and concludes with several papers that address the broader question of the relevance of outward-oriented growth theory for understanding the region's development.

The price of this volume is $65.00. Its editors, Takatoshi Ito and Anne O. Krueger, have both been research associates in the NBER's Program in International Trade and Macroeconomics. Ito is currently on leave from the NBER in the Research Department of the International Monetary Fund. Krueger is a professor of economics at Stanford University.

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NBER Working Papers

The Competitive Crash in Large-Scale Commercial Computing

Timothy F. Bresnahan and Shane Greenstein

NBER Working Paper No. 4901
October 1994
Industrial Organization, Productivity

We examine the factors that underlie buyer demand for large "Information Technology" (IT) solutions in an attempt to understand the competitive crash in large-scale commercial computing. We study individual buyer data from two periods: the mid-1980s, late in the period of a mature and stable large-systems market; and the early 1990s, very early in the diffusion of a new, competitive technology—client/server—when many buyers chose to wait for the new technology to mature. We clarify the implications of different theories of the competitive crash, and then test them. The most popular theories are far wrong, while the correct view emphasizes the "internal" adjustment costs to organizations making IT investments. Understanding buyer behavior illuminates not only the competitive crash, but also the factors underlying the slow realization of the social gains to IT in large, complex applications more generally.

Free Trade Taxation and Protectionist Taxation

Joel B. Slemrod

NBER Working Paper No. 4902
October 1994
JEL Nos. H20, F21
International Trade and Investment, Public Economics

This paper explores the normative theory of international taxation by recasting it in parallel with the theory of international trade. I first set out a definition of "free trade taxation," in the global context and then in the unilateral context. I then evaluate against this standard both the existing international tax regime and the U.S. international tax policy. I characterize which aspects of tax policy are free trade and which are protectionist; I differentiate between the "predatory protectionism" of tax havens and the "ownership protectionism" of tax policies that favor domestically resident multinational corporations.

Resisting Migration: The Problems of Wage Rigidity and the Social Burden

Assaf Razin and Efraim Sadka

NBER Working Paper No. 4903

October 1994
JEL Nos. F2, H2, F22
International Finance and Macroeconomics, Labor Studies

Like any trade activity in markets that function well, migration tends to enhance the efficiency of the allocation of resources. With nondistortionary policy instruments for income distribution that can compensate losers, migration generates income gains. But the gains tend to be rather small. However, when the labor market malfunctions and wages are rigid, migration exacerbates imperfections in the market. Consequently, it may lead to losses to the established population that can be quite sizable.

Migration also imposes a toll on the welfare state. Being unable to exclude migrants completely from various entitlement programs and public services, the modern welfare state finds it more and more costly to run its various programs.

These two economic considerations may help to explain the strong resistance to migration. Consequently, improvements in the functioning of the labor market (with possible compensation to wage earners who compete with unskilled migrants), and more selectivity in the scope of and eligibility for state entitlement programs, may potentially ease the resistance to migration from the established population to a large extent.

The Roles of Marketing, Product Quality, and Price Competition in the Growth and Composition of the U.S. Anti-Ulcer Drug Industry

Ernst R. Berndt, Linda Bui, David Reiley, and Glen Urban

NBER Working Paper No. 4904
October 1994
JEL Nos. D43, L65, M3
Industrial Organization, Productivity

The introduction of Tagamet in the United States in 1977 represented both a revolution in ulcer therapy and the beginning of an important new industry. Today there are four Prescription H_2-antagonist drugs: Tagamet, Zantac, Pepcid, and Axid. They comprise a multibillion-dollar market for the treatment of ulcers and other gastric acid conditions.

In this paper, we examine the determinants of sales in this market, using a carefully constructed dataset made possible by IMS America. We concentrate particularly on the marketing of these drugs to physicians through detailing and medical journal advertising. We also make an innovative attempt to distinguish between "industry-expanding" and "rivalrous" marketing efforts.

We find that the impact of total marketing on the expansion of overall industry sales declines as the number of products on the market increases. In addition, we find that the stock of industry-expanding marketing depreciates at a near-zero rate, while the stock of marketing oriented toward rivalrous market share competition depreciates at a 40 percent annual rate. We also find that the products' sales are affected significantly by price, quality attributes (such as the number of FDA-approved indications and the number of adverse drug interactions), and order of entry into the market.

How a Fee Per Unit of Garbage Affects Aggregate Recycling in a Model with Heterogeneous Households

Thomas C. Kinnaman and Don Fullerton

NBER Working Paper No. 4905
October 1994
JEL Nos. H23, H42, H71
Public Economics

This paper develops a model of household choices regarding garbage disposal, recycling, and littering. In particular, we consider the impact of a user fee for garbage collection on heterogeneous households with different preferences for recycling. Our model explains why some households participate in curbside recycling programs even without a user fee, while others do not participate, even with a user fee, and why certain households litter. We find that an increase in the user fee could decrease aggregate recycling.

Aging and Productivity, Rationality and Matching: Evidence from Economists

Daniel S. Hamermesh

NBER Working Paper No. 4906
October 1994
JEL No. J41
Labor Studies

Economists' productivity, as measured by publication in leading journals, declines very sharply with age. This is a rational response to economic incentives and/or changing physical or mental abilities: there is no difference by age in the probability that an article submitted to a leading journal will be accepted. The probability of acceptance does show increasing heterogeneity with age, which is related to the quality of the author. This is consistent with models of optimal investment in human capital, and especially with occupational matching models.

Investment Opportunities, Managerial Discretion, and the Security Issue Decision

Kooyul Jung, Yong-Cheol Kim, and René M. Stulz

NBER Working Paper No. 4907
October 1994
Corporate Finance

Given the agency costs of managerial discretion, equity financing is advantageous for the shareholders of firms with valuable investment opportunities but not for the shareholders of other firms. Accordingly, we find that firms with good investment opportunities: 1) are more likely to issue equity than debt; 2) have a smaller abnormal return (in absolute value) when the issue is announced; and 3) experience substantial asset growth following the issue. Firms that issue equity, even though they do not have good investment opportunities, experience a larger abnormal return (in absolute value) when the issue is announced, and invest more after the issue than comparable firms that issue debt.

How Different Is Japanese Corporate Finance? An Investigation of the Information Content of New Security Issues

Jun-Koo Kang and René M. Stulz

NBER Working Paper No. 4908
October 1994
Corporate Finance

We study the shareholder wealth effects associated with 875 new security issues in Japan from January 1, 1985 to May 31, 1991. Our sample includes public equity, private equity, rights offerings, straight debt, warrant debt, and convertible debt issues. Contrary to the U.S. experience, the announcement of convertible debt issues in Japan is accompanied by a significant positive abnormal return of 1.05 percent. The announcement of equity issues has a positive abnormal return of 0.45 percent, significant at the 0.10 level, but this return can be attributed to one year in our sample and is offset by a negative abnormal return of 1.01 percent on the issue date. The abnormal returns are related negatively to firm size; for equity issues (but not for convertible debt issues), large Japanese firms have significant negative abnormal returns at the announcement date. Our evidence is consistent with the view that Japanese managers decide to issue shares based on different considerations than American managers.

Democracy and Growth

Robert J. Barro

NBER Working Paper No. 4909
October 1994
JEL Nos. O10, O40
Growth

I analyze growth and democracy (subjective indexes of political freedom) for a panel of about 100 countries from 1960 to 1990. The favorable effects on growth include maintenance of the rule of law, free markets, small government consumption, and high human capital. Once these kinds of variables and the initial level of real per-capita GDP are held constant, the overall effect of democracy on growth is weakly negative. There is a suggestion of a nonlinear relationship, in which democracy enhances growth at low levels of political freedom but depresses growth when a moderate level of freedom has been attained already. Improvements in the standard of living—measured by GDP, life expectancy, and education—substantially raise the probability that political freedoms will grow. These results allow for predictions about which countries will become more or less democratic in the future.

Crime and the Job Market

Richard B. Freeman

NBER Working Paper No. 4910
October 1994
Law and Economics, Labor Studies

This paper presents evidence on the relationship among incarceration, crime, and the economic incentives to crime, ranging from unemployment to income inequality. It makes three points:

1) The United States has incarcerated an extraordinarily high proportion of men of working age. In 1993, 1.9 percent of the male work force was incarcerated; among black males, 8.8 percent of the work force was incarcerated..

2) The rising trend in incarceration should have reduced the rate of crime, through the incapacitation of criminals and through the deterrent effect of potential arrest and imprisonment. But administrative records show no such drop in crime, and the victims' survey shows a fall far below what could be expected on the basis of incapacitation by itself.

3) The implication is that, among the noninstitutional population, there was an increased propensity to commit crime.

The paper focuses on the possibility that the continued high rate of crime in the United States, despite massive imprisonment of criminals, may be one of the costs of the rising inequality in the country, and in particular of the falling real earnings of the less educated. While we lack a "smoking gun" for such a relationship, the preponderance of evidence suggests that economic incentives have played a role in the increased propensity to commit crime.

The Dynamics of Part-Time Work

Rebecca M. Blank

NBER Working Paper No. 4911
November 1994
JEL No. J22
Labor Studies

This paper uses 14 years of data from the Panel Survey of Income Dynamics to explore choices made by adult women regarding full-time, part-time, or no labor market work. A variety of models indicate that past choices should be important in predicting current labor supply choices. I compare the effectiveness of several estimation strategies that require varying amounts of historical information. My results indicate that past history *is* very important in predicting current labor supply. Given the lack of data in many cases, I then explore how much is lost when little or no longitudinal information is available.

In addition, I consider the substantive role of part-time work in the labor market. Part-time workers are a very heterogeneous group, in the midst of very different labor supply patterns. Most women use part-time work as a temporary alternative to full-time work or to being out of the labor market; few women use it as a transitional step into full-time employment. I carry out simulations suggesting the potential impact on future labor supply of mandating that low-skilled women who are out of the labor market accept part-time work.

Ethnicity, Neighborhoods, and Human Capital Externalities

George J. Borjas

NBER Working Paper No. 4912
November 1994
JEL No. J1
Labor Studies

The socioeconomic performance of today's workers depends not only on their parents' skills, but also on the average skills of their parents' ethnic group (or ethnic capital). This paper investigates the link between that ethnic externality and ethnic neighborhoods. The evidence indicates that residential segregation and the external effect of ethnicity are linked, partly because ethnic capital summarizes the socioeconomic background of the neighborhood where the children were raised. Ethnicity has an external effect, even among persons who grow up in the same neighborhood, when children are exposed frequently to persons who share their ethnic background.

Who Leaves? The Outmigration of the Foreign Born

George J. Borjas and Bernt Bratsberg

NBER Working Paper No. 4913
November 1994
JEL No. J1
Labor Studies

We analyze return migration of foreign-born persons from the United States. We argue that return migration may have been planned as part of a life-cycle goal for some immigrants. Return migration also occurs because immigrants base their initial migration decision on erroneous information about opportunities in the United States. We use the 1980 Census, and administrative data from the Immigration and Naturalization Service, and find that immigrants tend to return to wealthy countries that are not too far from the United States. Moreover, return migration accentuates the characteristics of the immigrant population left in the United States.

Economic Conditions and Alcohol Problems

Christopher J. Ruhm

NBER Working Paper No. 4914
November 1994
JEL No. I12
Health Economics

This study investigates the relationship between macroeconomic conditions and two alcohol-related outcomes: liquor consumption, and highway vehicle fatalities. I estimate fixed-effect models for the 48 contiguous states from 1975–88 and focus on within-state variations. Alcohol consumption and traffic deaths vary procyclically, with a major portion of the effect of economic downturns attributed to reductions in income. The intake of hard liquor is the most sensitive to the state of the macroeconomy. However, there is no evidence that fluctuations in economic conditions have a disproportionate impact on the drunk driving of young adults.

Cadillac Contracts and Up-Front Payments: Efficient Investment Under Expectation Damages

Aaron S. Edlin

NBER Working Paper No. 4915
November 1994
JEL No. K00
Law and Economics

This paper shows that up-front payments can play a crucial role in providing efficient investment incentives when contracts are incomplete: they can eliminate the overinvestment effect identified by Rogerson (1984) and Shavell (1980) when courts use an expectation damage remedy. This method extends to complex contracting situations if parties combine up-front payments with what we call "Cadillac" contracts: contracts for a very high quality or quantity. This combination provides efficient investment incentives in complex contracting problems when an expectation damage remedy is accompanied by a broad duty to mitigate damages. An expectation remedy appears well-suited to multidimensional, but one-sided, investment problems, in contrast to specific performance, which Edlin and Reichelstein (1993) showed is well-suited to two-sided, but unidimensional, investment problems.

Government Intervention in the Markets for Education and Health Care: How and Why?

James M. Poterba

NBER Working Paper No. 4916
November 1994
JEL Nos. H10, H51
Health Care, Labor Studies, Public Economics

Education and health care are the two largest government expenditure items in the United States. The public sector directly provides the majority of educational services, through the public school bureaucracy, while most public support for health care is channeled through a system of tax-supported government payments for services furnished by private providers. The contrast between public policies in these markets raises a host of questions about the scope of government in a mixed economy, and the structure of policies for market intervention.

This paper examines how two standard arguments for government intervention in private markets—market failure and redistribution—apply to the markets for education and medical care. It then considers the problem of "choice of instrument": the choice among intervention through price subsidies; mandates; and direct public provision of services in these markets. Economic arguments alone seem unable to explain the sharp divergence between the nature of public policies with respect to education and medical care. Moreover, there is virtually no evidence on the empirical magnitudes of many of the key parameters needed to guide policy in these areas, such as the social externalities associated with primary and secondary education, or the degree to which adverse selection in the insurance market prevents the purchase of private insurance.

High-Wage Workers and High-Wage Firms

John M. Abowd, Francis Kramarz, and David N. Margolis

NBER Working Paper No. 4917
November 1994
JEL Nos. J31, C23
Labor Studies

We study a longitudinal sample of over one million French workers and more than 500,000 employing firms, decomposing real total annual compensation per worker into components related to observable characteristics, worker and firm heterogeneity, and residual variation. Except for the residual, all the components may be correlated in an arbitrary fashion.

We find that at the level of the individual, "person-effects"—especially those not related to such observables as education—are the most important source of wage variation in France. Firm-effects, while important, are not as important as person-effects.

At the level of firms, we find, enterprises that hire high-wage workers are more productive but not more profitable. They also use more capital and high-skilled employees. Enterprises that pay higher wages, after person-effects are taken into account, are more productive and more profitable. They are also more capital intensive, but do not use more high-skilled labor. We also find that person-effects explain 92 percent of interindustry wage differentials.

An Economic Analysis of Works Councils

Richard B. Freeman and Edward P. Lazear

NBER Working Paper No. 4918
November 1994
Labor Studies

Works councils, mandated by law and found in most Western European economies, are elected bodies of employees, with rights to information, consultation and, in some cases, codetermination of employment conditions at local workplaces. Many European employers and unions believe that councils improve communication between workers and management, raising social output, while reducing the speed with which decisions are made.

This paper analyzes the operation of councils as a means of improving social output by creating more cooperative labor relations. We argue that councils are mandated because: 1) the incentive for companies to institute them and delegate power to them falls short of the social incentive; 2) workers provide more accurate information to employers about preferences when councils have some say over how that information is used; and 3) the communication from employers to workers produces socially desirable worker concessions in bad times that would not occur without this institution. We also compare a jury-style random selection of works councilors with selection via elections.

A Model of Fiat Money and Barter
Fumio Hayashi and Akihiko Matsui

NBER Working Paper No. 4919
November 1994
JEL Nos. D51, E42, E52
Monetary Economics

We present an infinite-horizon model with capital in which fiat money and barter are two competing means of payment. Fiat money has value because barter is limited by the extent of a double coincidence of wants. The pattern of exchange generally involves both money and barter. We find that the Chicago rule is sufficient for Pareto efficiency, while nominal interest smoothing is necessary. For a specific utility function, we provide a complete characterization of the patterns of exchange, and calculate the range of inflation rates over which a stationary monetary equilibrium exists.

Does Competition from HMOs Affect Fee-for-Service Physicians?
Laurence C. Baker

NBER Working Paper No. 4920
November 1994
JEL Nos. I1, L8
Health Care

This paper develops estimates of HMO market share for all counties in the United States, and then examines the relationship between HMO market share and the fee for a normal office visit with an established patient that 2845 fee-for-service (FFS) physicians charge. I estimate that increases of 10 percentage points in HMO market share are associated with decreases of approximately 11 percent in the normal office visit fee. However, the incomes of the physicians in the sample are not lower in areas with higher HMO market share. In addition, the quantity of services provided, measured by the number of hours worked and the number of patients seen per week, is not higher in these areas. While it is possible that physicians induce demand to change the volume or mix of services provided to patients in ways that do not affect the number of hours worked or patients seen, it is also possible that FFS physicians respond to competition from HMOs by adopting strategies in which the price for an office visit is reduced but prices for other services are raised.

The Effect of Credit Market Competition on Lending Relationships
Mitchell A. Petersen and Raghuram G. Rajan

NBER Working Paper No. 4921
November 1994
JEL Nos. G21, G28, G32
Corporate Finance

We show that the extent of competition in credit markets is important in determining the value of lending relationships. Creditors are more likely to finance credit constrained firms when credit markets are concentrated because it is easier for these creditors to internalize the benefits of assisting the firms. Our model has implications about the availability and the price of credit as firms age in different markets. We offer evidence for these implications from small business data, and conclude with conjectures on the costs and benefits of liberalizing financial markets, as well as the timing of such reforms.

Wage Differentials in Italy: Market Forces, Institutions, and Inflation
Christopher L. Erickson and Andrea Ichino

NBER Working Paper No. 4922
November 1994
Labor Studies

During the 1970s, Italy experienced an extreme compression of wage differentials, similar to the better-known situation in Sweden. Most evidence suggests that this compression came to a stop around 1982–3, coincident with a major institutional change (the escalator clause in Italian union contracts), a major economic change (the slowdown in inflation), a major technological change (industrial restructuring and the computer revolution), and a major political change (the loss of support for unions and their egalitarian pay policies). While we cannot distinguish definitively among the relative influences of institutions, market forces, technology, and politics, our analysis of skill-level wage differentials and our comparisons at the individual level with the more laissez-faire U.S. system suggest that both inflation and egalitarian wage-setting institutions have influenced Italian wage compression importantly in the regular sector of the economy. Yet, this very compression may well have contributed to the flight away from the regular sector of the economy at both ends of the skill distribution, plausibly leading to a greater overall degree of inequality for the whole economy than is apparent from our analysis of wage differentials in the regular sector.

Tests of Three Parity Conditions: Distinguishing Risk Premiums and Systematic Forecast Errors
Richard C. Marston

NBER Working Paper No. 4923
November 1994
JEL No. F31
International Finance and Macroeconomics

Two explanations typically are given for why nominal or real returns differ across currencies: foreign exchange risk premiums and systematic (rational) forecast errors. This study reexamines three parity conditions in international finance—uncovered interest parity, purchasing power parity, and real interest parity—to determine the relative importance of these two factors. I develop joint tests of the parity conditions by relating nominal and real interest differentials and inflation differentials to the same set of variables currently known to investors. I then test parameter restrictions based on knowing that risk premiums affect only nominal and real interest differentials, but not inflation differentials, while systematic errors in forecasting exchange rates affect only nominal interest differentials and inflation differentials, but not real interest differentials.

Interest Allocation Rules, Financing Patterns, and the Operations of U.S. Multinationals
Kenneth A. Froot and James R. Hines, Jr.

NBER Working Paper No. 4924
November 1994
JEL Nos. H25, F23, G30
International Finance and Macroeconomics, International Trade and Investment, Public Economics

This paper examines the impact of the 1986 change in U.S. interest allocation rules on the investment and financing decisions of American multinationals. The 1986 change reduced the tax deductibility of the interest expenses of firms with excess foreign tax credits. The resulting increase in the cost of debt gives firms incentives to substitute away from debt finance. Furthermore, to the extent that perfect financing substitutes are not available, the overall cost of capital rises as well.

Our empirical tests indicate that the loss of tax deductibility of parent-company interest expenses significantly reduces borrowing and investing by firms with excess foreign tax credits. The same firms tend to undertake new lease commitments, which may reflect that leases are alternatives to capital ownership. In addition, firms affected by the tax change tend to scale back their foreign and total operations. These results are consistent with the hypothesis that firms substitute away from debt when debt becomes more expensive, and that the loss of tax shields on interest increases a firm's cost of capital.

Do Pensions Increase the Labor Supply of Older Men?
Christopher J. Ruhm

NBER Working Paper No. 4925
November 1994
JEL No. J26
Aging, Labor Studies

This paper investigates the relationship between pension coverage and the retirement behavior of older men. Pensions are associated with higher rates of job holding for males in their late fifties and early sixties, but with lower rates for those aged 65 through 69. The age at which one becomes employed at a job with pension coverage is correlated positively with future labor supply. Combined with evidence on changes in labor force participation rates with age, this pattern makes it unlikely that broadened pension coverage explains a substantial portion of the trend toward earlier male retirement.

Technology and Trade
Gene M. Grossman and Elhanan Helpman

NBER Working Paper No. 4926
November 1994
JEL Nos. F10, O30, D41
International Trade and Investment

We survey research on the relationship between technology and trade. We begin with the old literature, which treated the state of technology as exogenous and asked how changes in technology affect the trade pattern and welfare. Recent research has attempted to endogenize technological progress that results either from learning-by-doing or from investments in research and development. This allows one to examine not only how technology affects trade, but also how trade affects the evolution of technology. We emphasize the parallels between the models with learning-by-doing and those with explicit R and D, and highlight the role that the geographic extent of knowledge spillovers plays in mediating the relationship between trade and technological progress.

Foreign-Owned Firms and U.S. Wages
Robert E. Lipsey

NBER Working Paper No. 4927
November 1994
JEL Nos. F23, J31
International Trade and Investment, Labor Studies

Foreign-owned establishments in the United States pay higher wages, on average, than domestically owned establishments. The foreign-owned establishments tend to be in higher-wage industries and also to pay higher wages within industries. They tend to locate in lower-wage states, but to pay more than domestically owned firms within industries within states. Wages in general, and wages in domestically owned establishments, tend to be higher in states and industries in which foreign-owned establishments account for a larger proportion of employment.

Foreign-owned establishments that were new in 1990, mostly takeovers, had lower-than-average wage levels in that year, but larger increases between 1990 and 1991. Increases in sales per worker and average wages were larger where employment growth was lower, possibly an indication that lower-productivity, lower-wage workers were dropped by the new owners.

Fixes: Of the Forward Discount Puzzle

Robert P. Flood and Andrew K. Rose

NBER Working Paper No. 4928
November 1994
JEL No. F31
International Finance and Macroeconomics

Regressions of ex post changes in floating exchange rates on appropriate interest differentials typically imply that the high interest rate currency tends to appreciate: that is the "forward discount puzzle." Using data from the European Monetary System (EMS), we find that a large part of the forward discount puzzle vanishes in regimes with fixed exchange rates. That is, deviations from uncovered interest parity appear to vary depending upon the exchange rate regime. By using the many EMS realignments, we are also able to quantify the "peso problem."

Health and Labor Force Participation of Older Men, 1900–91

Dora L. Costa

NBER Working Paper No. 4929
November 1994
JEL Nos. J26, N31
Aging, Development of the American Economy, Health Economics, Labor Studies

I investigate how the relationship between health status and retirement among older men has changed since 1900, using weight adjusted for height, or Body Mass Index (BMI), as a proxy for health. I find that both in 1900 and again in 1985–91, the relative risk of labor force nonparticipation increases for the excessively lean and obese. The BMI level that minimizes the relative risk of labor force nonparticipation remains unchanged.

However, in 1900 both the relative risk of nonparticipation among men at low and high BMI levels, and the elasticity of nonparticipation with respect to BMI, were greater than today. This suggests that health is now less important to the retirement decision than it was in the past. The difference in the relative risk of nonparticipation is especially pronounced at high BMI levels. Declining physical job demands and improved control of chronic conditions may explain the difference.

The findings suggest that the impact of improvements in health on participation rates is increasingly more likely to be outweighed by the impact of other factors. Greater efforts made to increase the incorporation of the old and disabled into the labor force therefore may have a minimal impact on retirement rates. The findings also imply that in the past the economic costs of poor health were substantial.

Physician Payments and Infant Mortality: Evidence from Medicaid Fee Policy

Janet Currie, Jonathan Gruber, and Michael Fischer

NBER Working Paper No. 4930
November 1994
JEL Nos. I18, H51
Health Care, Public Economics

While efforts to improve the health of the uninsured have focused on demand side policies such as increasing insurance coverage, supply side changes may be equally important. Yet there is little direct evidence on the effect of policies designed to increase the supply of Medicaid services to the poor. We provide such evidence by examining the relationship between infant mortality and the ratio of Medicaid fees to private fees for obstetricians/gynecologists.

We build a state- and year-specific index of the fee ratio for 1979–92, a period of substantial variation in relative Medicaid fees. We find that increases in fee ratios are associated with significant declines in the infant mortality rate. We also find that higher fees raise payments made to physicians and clinics under the Medicaid program, but reduce payments to hospitals.

Finally, we compare the cost effectiveness of reducing infant mortality by increasing fee ratios to the efficacy of reducing mortality by expanding the Medicaid eligibility of pregnant women. Although our results are sensitive to the time period used, we conclude that raising fee ratios is at least as cost effective as increasing eligibility.

International Patenting and Technology Diffusion

Jonathan Eaton and Samuel Kortum

NBER Working Paper No. 4931
November 1994
JEL Nos. F43, O14, O31
Growth, International Trade and Investment, Productivity

We model the invention of new technologies and their diffusion across countries. Our model predicts that, eventually, all countries will grow at the same rate, with each country's productivity ranking determined by how rapidly it adopts inventions. The common growth rate depends on research efforts in all countries; research effort is determined by how much inventions earn at home and abroad. Patents affect the return to invention.

We relate the decision to patent an invention internationally to the cost of patenting within a country, and to the expected value of patent protection in that country. Thus we can infer the direction and magnitude of the international diffusion of technology from data on international patenting, productivity, and research.

We fit the model to data from the five leading research economies. The parameters indicate how much technology flows among these countries, and how much each country earns from its inventions domestically and elsewhere. Our results imply that foreign countries are important sources of technology even though countries earn most of their return to innovation at home. For example, about half of U.S. productivity growth derives from foreign technology, yet U.S. inventors earn 98 percent of the revenue from their inventions domestically.

Taxes, Technology Transfer, and the R and D Activities of Multinational Firms

James R. Hines, Jr.

NBER Working Paper No. 4932
November 1994
JEL Nos. H25, F23, H87
International Trade and Investment, Productivity, Public Economics

Multinational firms that use domestic technologies in foreign locations are required to pay royalties from foreign users to domestic owners. Foreign governments often tax these royalty payments. High royalty tax rates raise the cost of imported technologies. This paper examines the effect of royalty taxes on the local R and D intensities of foreign affiliates of multinational corporations, looking both at foreign-owned affiliates in the United States and at American-owned affiliates in other countries. The results indicate that higher royalty taxes are associated with greater R and D intensity on the part of affiliates, suggesting that local R and D is a substitute for imported technology.

Physician Financial Incentives and Cesarean Section Delivery

Jonathan Gruber and Maria Owings

NBER Working Paper No. 4933
November 1994
JEL No. I11
Health Care, Public Economics

The "induced demand" model states that, in the face of negative shocks to income, physicians may exploit their relationship with patients by providing excessive care in order to maintain their incomes. We test this model by analyzing a change in the financial environment facing obstetrician/gynecologists during the 1970s: declining fertility in the United States. We argue that the 13.5 percent fall in fertility over 1970–82 increased the income pressure on ob/gyns, and led them to substitute from normal childbirth toward a more highly reimbursed alternative: cesarean delivery. Using a nationally representative microdataset for this period, we show that there is a strong correlation between within-state declines in fertility and within-state increases in cesarean utilization.

Contagion and Bank Failures During the Great Depression: The June 1932 Chicago Banking Panic

Charles W. Calomiris and Joseph R. Mason

NBER Working Paper No. 4934
November 1994
Development of the American Economy

Studies of banking before the Depression argue that panics were the result of depositor confusion about the incidence of shocks, and that interbank cooperation avoided unwarranted failures. The Great Depression—with its concentration of bank failures at particular times and places—has been viewed as an exception. The June 1932 Chicago panic was a dramatic example of a banking panic during the Great Depression.

We use individual bank data to address the question of whether solvent Chicago banks failed during the panic because of confusion by depositors. We divide Chicago banks into three groups: panic failures; failures outside the panic window; and survivors. We compare the characteristics of these three groups to determine whether the banks that failed during the panic were similar ex ante to those that survived the panic, or whether they shared characteristics with other banks that failed.

Each category of comparison—the market-to-book value of equity; the estimated probability of failure or duration of survival; the composition of debt; the rates of withdrawal of debt during 1931; and the interest rates paid on debt—leads to the same conclusion. Banks that failed during the panic were similar to others that failed and different from survivors. The special attributes of failing banks were distinguishable at least six months before the panic, and were reflected in stock prices, probabilities of failure, debt composition, and interest rates at least that far in advance. We conclude that failures during the panic reflected relative weakness in the face of common asset value shock, rather than contagion. Other evidence points to cooperation among solvent Chicago banks as a key factor in avoiding unwarranted bank failures during the panic.

Historical Macroeconomic and American Macroeconomic History

Charles W. Calomiris and Christopher Hanes

NBER Working Paper No. 4935
November 1994
Development of the American Economy, Economic Fluctuations

Macroeconomic history offers more than longer time series or special "controlled experiments." It suggests a *historical definition* of the economy, which has implications for macroeconometric methods. The defining characteristic of the historical view is its emphasis on "path dependence": ways in which the *cumulative* past, including the history of shocks and their effects, change the structure of the economy. We review American macroeconomic history to illustrate its potential uses, and to draw out methodological implications. "Keynesian" models can account for the most obvious cyclical patterns in all historical periods, while "new classical" models cannot. Nominal wage rigidity was important historically, and some models of wage rigidity receive more support from history than others. A shortcoming of both Keynesian and new classical approaches is the assumption that low-frequency change is exogenous to demand. The history of the Kuznets cycle illustrates how aggregate-demand shocks can produce endogenous changes in aggregate supply. Economies of scale, learning effects, and convergences of expectations—many within the *spatial* contexts of city building and frontier settlement—seem to have been especially important in making the aggregate supply "path-dependent." Institutional innovation (particularly government regulation) has been another source of endogenous change in aggregate supply.

The historical view's emphasis on endogenous structural change points in the direction of a greater use of panel and cross-section analysis over short sample periods to identify the sources and consequences of macroeconomic shocks.

Eliciting Student Expectations of the Returns to Schooling

Jeff Dominitz and Charles F. Manski

NBER Working Paper No. 4936
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Labor Studies

We report here on the design and first application of an interactive computer-administered personal interview (CAPI) survey eliciting from high school students and college undergraduates their expectations of the income they would earn if they were to complete different levels of schooling. We also elicit respondents' beliefs about current earnings distributions. Whereas a scattering of earlier studies have elicited point expectations of earnings unconditional on future schooling, we elicit subjective earnings distributions under alternative scenarios for future earnings. We find that respondents, even ones as young as high school sophomores, are willing and able to respond meaningfully to questions eliciting their earnings expectations in probabilistic form. Respondents vary considerably in their earnings expectations, but there is a common belief that the returns to a college education are positive, and that earnings rise between ages 30 and 40. There also is a common belief that one's own future earnings are rather uncertain. Moreover, respondents tend to overestimate the current degree of earnings inequality in American society.

Using Expectations Data to Study Subjective Income Expectations

Jeff Dominitz and Charles F. Manski

NBER Working Paper No. 4937
November 1994
Labor Studies

We have collected data on the one-year-ahead income expectations of members of American households in our Survey of Economic Expectations (SEE), a module of a national continuous telephone survey conducted at the University of Wisconsin. The income-expectations questions take this form: "What do you think is the percent chance (or what are the chances out of 100) that your total household income, before taxes, will be less than Y over the next 12 months?" We use the responses to a sequence of such questions posed for different income thresholds Y to estimate each respondent's subjective probability distribution for next year's household income. We use the estimates to study the cross-sectional variation in income expectations for one year into the future.

Monetary Policy and the Term Structure of Interest Rates

Bennett T. McCallum

NBER Working Paper No. 4938
November 1994
JEL Nos. E43, E58
Economic Fluctuations, Monetary Economics

This paper addresses a prominent empirical failure of the expectations theory of the term structure of interest rates under the assumption of rational expectations: the magnitude of slope coefficients in regressions of short-rate (or long-rate) changes on long–short spreads. I show that the anomalous empirical findings can be rationalized with the expectations theory by recognizing an exogenous random (but possibly autoregressive) term premium, plus assuming that monetary policy involves smoothing an interest rate instrument—the short rate—along with responses to the prevailing level of the spread.

The Dynamics of Domestic Violence: Does Arrest Matter?

Ann Dryden Witte and Helen V. Tauchen

NBER Working Paper No. 4939
November 1994
JEL Nos. K42, C32
Labor Studies

Using data collected by the Minneapolis Domestic Violence Experiment, we find that arrest deters domestic violence, but that the effect wears off quite quickly. We also find that current employment for the male is associated with lower levels of violence. However, like arrest, the effect of employment is transitory. If the male becomes unemployed, the level of violence will increase quite rapidly. Violence in one period is associated with higher probabilities of violence in subsequent periods.

From a methodological perspective, our results suggest that policy evaluation and deterrence research would benefit from using models that allow examination of the dynamic path of intervention effects. The effect of private and social programs need not be constant over time, and applying traditional, static models that necessarily impose such an assumption may produce misleading results. For Minneapolis, static models produced the result that "arrest works." The dynamic model suggests a different conclusion: "arrest buys us a little time."

International Trade Theory: The Evidence

Edward E. Leamer and James Levinsohn

NBER Working Paper No. 4940
November 1994
JEL No. F10
International Trade and Investment

This paper provides a critical look at recent empirical work in international trade theory. We ask why empirical work in international trade perhaps has not been as influential as it could have been. We also provide several suggestions on directions for future empirical research in international trade.

Disability Insurance Rejection Rates and the Labor Supply of Older Workers

Jonathan Gruber and Jeffrey D. Kubik

NBER Working Paper No. 4941
November 1994
JEL Nos. H55, J26
Aging, Health Care, Labor Studies, Public Economics

Disability Insurance (DI), which provides income support to disabled workers, has been criticized for inducing a large fall in the labor force participation rate of older workers. We study the effects of one policy response designed to address this moral hazard problem: raising the rate at which DI claims are denied. Initial DI applications are decided at the state level, and, in response to a funding crisis for the DI program in the late 1970s, the states raised their rejection rates for first-time applicants by 30 percent on average. However, the extent of this rise varied substantially across states. We use this variation to estimate the reduction in labor force nonparticipation among older workers in response to increases in the denial rate. A 10 percent increase in denial rates led to a 2.7 percent fall in nonparticipation among 45–64-year-old males; between 1/2 and 2/3 of this effect is a true reduction in labor force leaving, with the remainder accounted for by the return to work of denied applicants. We find some support for the notion that increases in denial rates effectively target their incentive effects to more able individuals; the fall in labor force nonparticipation was much stronger among more able workers, according to an anthropometric measure of disability.

Can Having Fewer Partners Increase Prevalence of AIDS?

Michael Kremer

NBER Working Paper No. 4942
December 1994
JEL Nos. I10, I12
Health Care, Health Economics

If information about sexual history is not known equally by potential partners, then sexual activity has repercussions: abstinence by individuals with few partners actually increases the average probability of HIV infection in the pool of available partners. Since this increases the prevalence of HIV among high-activity people, who disproportionately influence the future spread of the disease, it also may increase the long-run prevalence of AIDS. Preliminary calculations suggest that most people have few enough partners that further reductions would increase the prevalence of AIDS overall. Therefore, public health messages will be more likely to reduce the prevalence of AIDS and create positive results if they stress condom use, rather than abstinence.

Insurance Rationing and the Origins of Workers' Compensation

Price V. Fishback and Shawn Everett Kantor

NBER Working Paper No. 4943
December 1994
JEL Nos. D45, J38, N32
Development of the American Economy

A central question concerning the economic motivation for the adoption of workers' compensation is the extent to which workers had access to their desired levels of private accident insurance around the turn of the century. If insurance were rationed, then the workers' primary option would have been to use their savings to protect against the risk of accident. Under this market condition, workers' compensation should have caused a reduction in households' precautionary saving. Based on a sample of over 7000 households surveyed for the 1917–9 Bureau of Labor Statistics Cost-of-Living Study, our analysis suggests that households did tend to save less, holding all else constant, if their states had workers' compensation in force, This finding, together with information about the insurance industry, provides some evidence that insurance companies were not able to effectively offer workplace accident insurance to a wide range of workers. By shifting the burden of insurance from workers to employers, workers' compensation benefited risk-averse workers who were rationed out of the insurance market, even if they paid for their more generous post-accident benefits through lower wages.

The GATT's Contribution to Economic Recovery in Postwar Western Europe

Douglas A. Irwin

NBER Working Paper No. 4944
December 1994
JEL Nos. F02, F13
International Trade and Investment

This paper examines the role of trade liberalization under the General Agreement on Tariffs and Trade (GATT) in promoting economic recovery and growth in Europe in the decade after World War II. The formation of the GATT does not appear to have stimulated a particularly rapid liberalization of world trade in the decade after 1947. Therefore, it is difficult to attribute much of a role to the GATT in the dramatic economic recovery that took place during the immediate postwar period, beyond that of an effective supporting actor. The principal contribution of the GATT during its first decade of operation rests more in securing binding agreements on early tariff reductions. This prevented countries from instituting higher tariffs as, under the guidance of other international institutions, import quotas and foreign exchange controls were being phased out during the 1950s.

Generating Equality and Eliminating Poverty, the Swedish Way

Richard B. Freeman and Anders Bjorklund

NBER Working Paper No. 4945
December 1994
Labor Studies

Sweden has a remarkable record in reducing inequality and virtually eliminating poverty. This paper shows that:

1) Sweden achieved its egalitarian income distribution and eliminated poverty largely because of its system of earnings and income determination, not because of the homogeneity of the population, nor its educational system.

2) In the job market, Sweden is distinguished by a relatively egalitarian distribution of hours of work among those employed (which may be an interrelated part of the Swedish economic system) and, until the recent recession, by a high employment rate.

3) Tax and transfer policies contribute substantially to Sweden's overall distribution record. In contrast to many social welfare systems, Sweden's is largely a workfare system, providing benefits for those with some work activity.

4) Part of Sweden's historic success in maintaining jobs for low-wage workers while raising their wages was the result of policies that directly or indirectly buttressed demand for low-skill workers, notably through public sector employment.

5) Sweden's tax and transfer policies have maintained the position of lower-income workers and families, including those with children, during its recent economic decline.

Intellectual Capital and the Firm: The Technology of Geographically Localized Knowledge Spillovers

Lynne G. Zucker, Michael R. Darby, and Jeff Armstrong

NBER Working Paper No. 4946
December 1994
Productivity

We examine the effects of university-based "star" scientists on three measures of performance for biotechnology enterprises in California: the number of products in development; the number of products on the market; and changes in employment. The star concept that Zucker, Darby, and Brewer (1994) demonstrated was important for the birth of U.S. biotechnology enterprises also predicts geographically localized knowledge spillovers, at least for products in development. However, when we break down university stars into those who have collaborated on publications with scientists affiliated with the firm, and all other university stars, there is a strong positive effect of the linked stars on all three firm-performance measures, and little or no evidence of an effect from the other university stars.

We develop a new hypothesis of geographically localized effects of university research that is consistent with market exchange: geographically localized effects occur for scientific discoveries characterized by natural excludability: those that can be learned only by working with discoverers or others who have received the knowledge through working together in the laboratory. Natural excludability results in intellectual capital, a transitory form of human capital, embodied in particular scientists whose services must be employed in order to practice the discovery. Contractual and/or ownership relationships occur between firms and the university scientists with intellectual capital, and importantly determine firm productivity and growth.

Did Workers Pay for the Passage of Workers' Compensation Laws?

Price V. Fishback and Shawn Everett Kantor

NBER Working Paper No. 4947
December 1994
JEL Nos. J31, J38
Development of the American Economy, Labor Studies

Market responses to legislative reforms often mitigate the expected gains that reformers promise in legislation. Contemporaries hailed workers' compensation as a boon to workers because it raised the amount of post-accident compensation paid to injured workers. Despite the large gains to workers, employers often supported the legislation. Several wage samples from the early 1900s show that employers were able to pass a significant part of the added costs of higher post-accident compensation onto some workers in the form of reduced wages. However, the wage offsets were smaller for union workers than for nonunion workers.

Prices, Output, and Hours: Empirical Analysis Based on a Sticky-Price Model

Julio J. Rotemberg

NBER Working Paper No. 4948
December 1994
JEL Nos. E3, E5
Economic Fluctuations, Monetary Economics

I show that a simple sticky-price model based on my 1982 work is consistent with a variety of facts about the correlation of prices, hours, and output. In particular, I show that it is consistent with a negative correlation between the detrended levels of output and prices when both the price and output data are detrended by the Beveridge–Nelson method. There is a negative and very strong correlation between the predictable movements in output and the predictable movements in prices in U.S. data. Consistent with the model, this correlation is stronger than the correlations between prices and hours of work.

I also study the size of the predictable price movements associated with predictable output movements, and the degree to which there are predictable movements in monetary aggregates associated with predictable movements in output. These facts shed light on the degree to which the Federal Reserve has pursued a policy designed to stabilize expected inflation.

Education and Health: Where There's Smoke There's an Instrument

William N. Evans and Edward Montgomery

NBER Working Paper No. 4949
December 1994
JEL Nos. J30, J31, I2
Health Economics, Labor Studies

Fuchs has suggested that the

persistent positive correlation between education and health habits can be explained by interpersonal differences in the discount rate. If he is correct, then some health habits can be used as instruments for education in standard wage equations. We use "whether an individual smoked at age 18" in such a fashion. This instrument is correlated strongly with years of education. We are not able to reject tests that show how the smoking/education link varies systematically across age cohorts and income groups. We do demonstrate that smoking at age 18 is correlated with other decisions made over time, such as about homeownership. We replicate the results in four additional datasets, and for both males and females.

An Intergenerational Model of Wages, Hours, and Earnings

Joseph G. Altonji and Thomas A. Dunn

NBER Working Paper No. 4950
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JEL Nos. D10, J22, J3
Labor Studies

We develop and estimate a model of the earnings, labor supply, and wages of young men and young women, their parents, and their siblings. We estimate the model using data on matched sibling and parent–child pairs from the National Longitudinal Survey of Labor Market Experience. We measure the extent to which a set of unobserved parental and family factors that drive wage rates and work hours independent of wage rates lead to similarities among family members in labor market outcomes.

We find strong similarities within the family in work hours running along gender lines. These similarities are caused primarily by preferences, rather than by labor supply responses to family similarities in wages. The wages of the father and mother influence the wages of both sons and daughters. A "sibling" wage factor also plays an important role in the determination of wages. We find that intergenerational correlations in wages substantially overestimate the direct influence of fathers, and especially mothers, on wages. This is because the father's and mother's wages are correlated positively. For the variance in earnings, the relative importance of the direct effect of wages, the labor supply response induced by wages, and the effect of hours preferences varies by gender, and by age in the case of women. For all groups, most of the effect of wages on earnings is direct, rather than through a labor supply response.

Puzzles in International Financial Markets

Karen K. Lewis

NBER Working Paper No. 4951
December 1994
Asset Pricing, International Finance and Macroeconomics

This paper presents a survey of two basic puzzles in international finance. The first is the "predictable excess return puzzle." The returns on deposits of foreign currency relative to deposits of domestic currency should be equal because of uncovered interest parity. However, researchers not only find that deviations from uncovered interest parity are predictable, but also that their variance exceeds the variance in expected changes in the exchange rate. I describe different explanations of this phenomenon, including the view that excess returns are driven by a foreign exchange risk premium, peso problems or learning, and market inefficiencies. While the research to date has been able to better define the "predictable excess return puzzle," and to suggest the most likely directions for future progress, no one explanation has provided a full answer to the puzzle.

Second is the "home bias puzzle." Empirical evidence shows that domestic residents do not diversify sufficiently into foreign stocks. This evidence is clear whether in models based on portfolio holdings or in consumption realizations across countries. I examine several possible explanations, including nontraded goods and market inefficiencies, although even after considering these possibilities, the puzzle remains.

Perspectives on PPP and Long-Run Real Exchange Rates

Kenneth A. Froot and Kenneth Rogoff

NBER Working Paper No. 4952
December 1994
JEL Nos. F1, F4
International Trade and Investment, International Trade and Macroeconomics

This paper reviews the literature on purchasing power parity (PPP) and other models of the long-run real exchange rate. We distinguish three stages of PPP testing, and focus on what has been learned from each. The most important overall lesson has been that the real exchange rate appears stationary over sufficiently long horizons. However, we argue that tests that ask whether any linear combination of prices and exchange rates is stationary have not necessarily rejected nonstationarity.

We also review a number of theories of the long-run real exchange rate—including the Balassa–Samuelson hypothesis—as well as the evidence supporting them. We argue that the persistence of real exchange rate movements can be generated by a number of sensible models, and that Balassa–Samuelson effects seem important, but mainly for countries with widely disparate levels of income growth.

Finally, we present new evidence testing the law of one price on 200 years of historical commodity price data for England and France. We also use a century of data from Argentina to test the possibility of sample-selection bias in tests of long-run PPP.

Economic Effects of Quality Regulations in the Daycare Industry

Ann Dryden Witte and Tasneem Chipty

NBER Working Paper No. 4953
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JEL Nos. K23, L51
Labor Studies, Public Economics

We estimate reduced-form models to discern the effect of state regulation on the quality of center and family daycare. Specifically, we consider the effects of the number of mandated inspections, limits on group size and staff/child ratio, and staff training requirements on equilibrium price and hours of care, and on the quality of care as measured by the actual staff/child ratio.

Our results indicate that child care regulations do affect equilibrium price, hours of care, and staff/child ratios. Child care regulations are binding. In equilibrium, only regulations about staff training appear to have consistently desirable effects. Such regulations decrease equilibrium price and hours of care, and increase the staff/child ratio for both centers and family daycare. Regulations of group size and the staff/child ratio have significant effects, but the welfare implications of their effects are more ambiguous.

Tax deductions and subsidies for child care have similarly ambiguous effects on welfare. For example, households that take a tax deduction for child care pay higher prices for care, consume more hours of care, and consume higher-quality daycare.

Neither a Borrower nor a Lender Be: An Economic Analysis of Interest Restrictions and Usury Laws

Edward L. Glaeser and José A. Scheinkman

NBER Working Paper No. 4954
December 1994
JEL Nos. G28, O10
Growth

Interest rate restrictions are among the most pervasive forms of economic regulation. We explain that these restrictions are a means of primitive social insurance. Limits on interest rates improve economic welfare, because agents borrow when they have temporary negative shocks to income: interest rate restrictions transfer wealth to agents who have experienced those negative shocks and whose marginal utility of income is high.

We assume that these shocks are not otherwise insurable, because of problems related to asymmetric information, or the difficulties inherent in writing complex contracts. Our model predicts that interest rate restriction will be tighter when income inequality is high (and not permanent) and when growth rates are low.

Data from U.S. states support a connection between inequality and usury laws. History suggests that this social insurance mechanism is one reason why usury laws persist, but it also suggests that usury laws have had different functions over time (for example, rent seeking; limiting agency problems within the church; limiting overcommitment of debts; and attacking commerce generally).

The Economic Benefits from Immigration

George J. Borjas

NBER Working Paper No. 4955
December 1994
JEL No. J6
Labor Studies

Natives benefit from immigration mainly because of complementarities in production between immigrant workers and other factors. These benefits are larger when immigrants are sufficiently "different" from the stock of native inputs to production. The available evidence suggests that the economic benefits from immigration for the United States are small, on the order of $6 billion, and almost certainly less than $20 billion annually. However, these gains could be increased considerably if the United States pursued an immigration policy that attracted a more skilled immigrant flow.

Timothy Besley and Anne C. Case

NBER Working Paper No. 4956
December 1994
JEL Nos. H73, J38
Labor Studies, Public Economics

The U.S. federal system provides great potential for estimating the effects of policy on behavior. If state policymaking is purposeful and responds to economic and political conditions within the state, then it may be necessary for analyses to identify and control for the forces that lead policies to change in order to obtain unbiased estimates of a policy's incidence. In this paper, we investigate how recognition of policy endogeneity affects attempts to analyze policy incidence. Our context is workers' compensation benefits. We believe that the analysis illustrates why it may be important to consider the implications of policy endogeneity more generally.

The Size and Timing of Devaluations in Capital-Controlled Developing Economies

Robert P. Flood and Nancy P. Marion

NBER Working Paper No. 4957
December 1994
JEL No. F3
International Finance and Macroeconomics

A developing country often pegs its exchange rate to a single currency, such as the U.S. dollar, even though it faces a higher inflation rate than the country to which it is pegged. As a consequence, it experiences misalignments of the real exchange rate and a series of easily anticipated devaluations. While the chaotic capital market events surrounding anticipated devaluations can be avoided through capital controls, the country is still left with the classic devaluation problem: when should it devalue, and by how much?

In this paper, we consider a policymaker who pegs the nominal exchange rate and adjusts the peg periodically so as to minimize a set of costs. The future times for devaluations are not currently known. The size and timing of devaluations are determined jointly.

This framework shows how changes in the stochastic environment affect both the size and timing of devaluation. Using cross-sectional data on 80 peg episodes from 17 Latin American countries from 1957–90, we find empirical support for the model's main predictions.

Hedging Options in a GARCH Environment: Testing the Term Structure of Stochastic Volatility Models

Robert F. Engle and Joshua Rosenberg

NBER Working Paper No. 4958
December 1994
Asset Pricing

We develop a methodology for testing the term structure of volatility forecasts, and analyze models of the volatility of the S&P 500 index. We compare volatility models by their ability to hedge options positions that are sensitive to the term structure of volatility. Overall, the most effective hedge is a Black–Scholes (BS) delta–gamma hedge, while the BS delta–vega hedge is the least effective. The most successful volatility hedge is "GARCH components delta–gamma," suggesting that the GARCH components estimate of the term structure of volatility is most accurate. The success of the BS delta–gamma hedge may be attributable to mispricing in the options market over the sample period.

Cross-Country Evidence on the Link Between Volatility and Growth

Garey Ramey and Valerie A. Ramey

NBER Working Paper No. 4959
December 1994
JEL Nos. E32, O40
Growth, International Finance and Macroeconomics, Economic Fluctuations

In a sample of 92 countries, as well as a sample of OECD countries, we find that countries with higher volatility have lower growth. Adding standard control variables strengthens the negative relationship. We also find that volatility induced by government spending is associated negatively with growth, even after we control for both time- and country-fixed effects.

The Effects of Unemployment Insurance Taxes and Benefits on Layoffs Using Firm and Individual Data

Patricia M. Anderson and Bruce D. Meyer

NBER Working Paper No. 4960
December 1994
JEL No. J65
Labor Studies, Public Economics

We examine the effects of unemployment insurance (UI) experience rating on layoffs, and find that incomplete experience rating is responsible for over 20 percent of temporary layoffs. The results are more mixed when UI is seen as a firm adjustment cost, or a component of the worker compensation package. While the evidence favors the adjustment-cost model, some of the predictions of each model we test are rejected by at least one of our specifications. Using new data, we also confirm the correlation found in past studies between experience rating proxies and layoffs. However, the differences between these proxies and state average firm tax costs and the anomalous instrumental variables estimates that we find suggest that it may be inappropriate to interpret this correlation causally.

A Fundamental Objection to Tax Equity Norms: A Call for Utilitarianism

Louis Kaplow

NBER Working Paper No. 4961
December 1994
JEL No. H21
Public Economics

Anti-utilitarian norms often are used in assessing tax systems. Two motivations support this practice. First, many believe utilitarianism to not be sufficiently egalitarian. Second, utilitarianism does not give independent weight to other equitable principles, notably concerns that reforms may violate horizontal equity or result in rank reversals in the income distribution. This investigation suggests that a policymaker who believes in the Pareto principle—that any reform preferred by everyone should be adopted—cannot adhere consistently to any of these anti-utilitarian sentiments. Moreover, the affirmative case for utilitarian tax policy assessment is stronger than generally is appreciated.

International Rules and Institutions for Trade Policy

Robert W. Staiger

NBER Working Paper No. 4962
December 1994
International Trade and Investment

What are the potential benefits from establishing international rules for the conduct of trade policy, and how should these rules be designed? These questions are of central importance to the evolution of national trade policies in the postwar era, when an elaborate system of international rules has evolved to facilitate the process of reciprocal trade liberalizion. Yet the theory of trade policy traditionally has had little to say about these rules and the issues that underlie them.

I review and synthesize several of the currents of a growing literature concerned with these questions. I have three objectives: 1) to describe the basic structure of international trade agreements as they exist in practice; 2) to explore theoretically the normative consequences of actual and alternative trade agreements; and 3) to offer some theoretically based explanation for the structure of trade agreements that we observe. I tackle the first objective by describing the important features of the General Agreement on Tariffs and Trade, and the latter two objectives by reviewing a body of literature and drawing out its implications.

A Retrospective on the Debt Crisis

Michael P. Dooley

NBER Working Paper No. 4963
December 1994
JEL No. F34
International Finance and Macroeconomics

In this paper, I argue that the international debt crisis of 1982 can best be understood as a prolonged negotiation between commercial banks and their own governments about who would bear the economic losses generated by loans made to developing countries. I contrast this interpretation of the debt crisis with the more familiar approach that emphasizes conflict between debtor countries and their creditors.

My main conclusion is that the failure of governments of industrial countries to resolve this conflict with their banks transformed an unremarkable financial crisis into a decade-long economic crisis for debtor countries. My analysis also suggests that recent capital inflows to developing countries are less likely to generate the same economic costs for debtor countries, even if changes in the economic environment generate similar losses for investors.

Getting Interventions Right: How South Korea and Taiwan Grew Rich

Dani Rodrik

NBER Working Paper No. 4964
December 1994
JEL Nos. O11, O40
Growth, International Trade and Investment, International Finance and Macroeconomics

Most explanations of the economic growth of Korea and Taiwan since the early 1960s emphasize export orientation. However, it is difficult to see how export orientation could have played a significant causal role in these countries' growth. The measured increase in the relative profitability of exports during the 1960s is not significant enough to account for the phenomenal export boom that ensued. Moreover, exports initially were too small to have a significant effect on aggregate economic performance.

A more plausible story focuses on the investment boom that took place in both countries. In the early 1960s, both economies had an extremely well-educated labor force relative to their physical capital stock, rendering the latent return to capital quite high. By subsidizing and coordinating investment decisions, government policy managed to engineer a significant increase in the private return to capital. An exceptional degree of equality in income and wealth helped, by rendering government intervention effective and keeping it free of rent-seeking. The outward orientation of the economy was the result of the increase in demand for imported capital goods.

Market Underreaction to Open Market Share Repurchases

David Ikenberry, Josef Lakonishok, and Theo Vermaelen

NBER Working Paper No. 4965
December 1994
Corporate Finance

We examine long-run firm performance following announcements of open market share repurchases that occurred during 1980 to 1990. We find that the average abnormal four-year buy-and-hold return measured after the initial announcement is 12.1 percent. For "value" stocks, companies more likely to be repurchasing shares because of undervaluation, the average abnormal return is 45.3 percent. For repurchases announced by "glamour" stocks, in which undervaluation is less likely to be an important motive, no positive drift in abnormal returns is observed. Thus, at least with respect to value stocks, the market errs in its initial response and appears to ignore much of the information conveyed through repurchase announcements.

Forecasting Transaction Rates: The Autoregressive Conditional Duration Model

Robert F. Engle and Jeffrey R. Russell

NBER Working Paper No. 4966
December 1994
Asset Pricing

We 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. In contrast to fixed interval analysis, our model treats the time between observations as a random process, and therefore is in the spirit of the models of time deformation initially proposed by: Tauchen and Pitts (1983); Clark (1973); and more recently discussed by Stock (1988); Lamoureux and Lastrapes (1992); Muller et al. (1990); and Ghysels and Jasiak (1994). We do not require auxiliary data or assumptions on the causes of time flow. We provide strong evidence for duration clustering beyond a deterministic component for the financial transactions data we analyze. We show that a very simple version of the model can account successfully for the significant autocorrelations in the observed durations between trades of IBM stock on the consolidated market. A simple transformation of the duration data allows us to include volume in the model.

Spillovers, Foreign Investment, and Export Behavior

Brian Aitken, Gordon H. Hanson, and Ann E. Harrison

NBER Working Paper No. 4967
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JEL Nos. F13, F23
International Trade and Investment

Case studies of export behavior suggest that firms that penetrate foreign markets reduce entry costs for other potential exporters, either through learning-by-doing or through establishing buyer–supplier linkages. We pursue the idea that spillovers associated with one firm's export activity reduce the cost of foreign market access for other firms. We identify two potential sources of spillovers: export activity in general, and the specific activities of multinational enterprises. We use a simple model of export behavior to derive a specification for the probability that a firm exports. Using panel data on Mexican manufacturing plants, we find evidence consistent with spillovers from the export activity of multinational enterprises, but not with general export activity.

The Dynamics of Dual-Job Holding and Job Mobility

Christina H. Paxson and Nachum Sicherman

NBER Working Paper No. 4968
December 1994
JEL Nos. J22, J63
Labor Studies

This paper concerns the incidence and dynamics of dual-job holding, and its link to job mobility. The first section presents evidence on patterns of dual-job holding, changes in hours, and job mobility in the United States, based on data from the Panel Study of Income Dynamics and the Current Population Survey. Our results indicate that most workers experience dual-job holding sometime during their working lives, and that there is a great deal of movement into and out of dual-job holding. Mobility into and out of second jobs is associated with large changes in weekly and annual hours, and there is evidence that dual-job holding is prompted by constraints on hours on the main job.

The second section of the article turns to theories of dual-job holding. Much of the empirical literature on second jobs is motivated by a simple model of labor supply in which workers face upper constraints on main-job hours: a worker who would like to work more on his main job, but cannot, will take a second job provided that the second-job wage is high enough. These models do not account for the fact that workers also may avoid hours constraints by finding new main jobs with higher hours. We develop a model of dual-job holding and job mobility in which decisions to take second jobs and/or change main jobs are made simultaneously. This model is consistent with our findings, and provides new insights into the economics of dual-job holding and labor mobility.

Indicator Properties of the Paper-Bill Spread: Lessons from Recent Experience

Benjamin M. Friedman and Kenneth N. Kuttner

NBER Working Paper No. 4969
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JEL Nos. E52, E32, E44
Monetary Economics

One feature of U.S. postwar business cycles that by now is widely documented is the tendency of the spread between the respective interest rates on commercial paper and Treasury bills to widen shortly before the onset of recessions. By contrast, the paper-bill spread did not anticipate the 1990–1 recession.

This paper supports two (not mutually exclusive) explanations for this departure from past experience. First, at least part of the predictive content of the paper-bill spread with respect to business cycle fluctuations stems from its role as an indicator of monetary policy: the 1990–1 recession was unusual in postwar U.S. experience in not being immediately precipitated by tight monetary policy. Second, movements of the spread during the few years just prior to the 1990–1 recession were influenced strongly by changes in the relative quantities of commercial paper, bank CDs, and Treasury bills that occurred for reasons unrelated to the business cycle.

This latter finding in particular sheds light on the important role of imperfect substitutability of different short-term debt instruments in investors' portfolios, and highlights the burdens associated with using relative interest rate relationships as business cycle indicators.

Valuation of New Goods Under Perfect and Imperfect Competition

Jerry A. Hausman

NBER Working Paper No. 4970
December 1994
JEL Nos. D43, C43
Productivity

The Consumer Price Index (CPI) attempts to answer the question of how much more (or less) income a consumer requires to be as well off in period one as in period zero, given changes in prices, changes in the quality of goods, and the introduction of new goods (or the disappearance of existing goods). However, the CPI has not attempted to estimate the effect of the introduction of new goods, despite the recognition of their potential importance in a cost-of-living index.

In this paper, I first explain the theory of cost-of-living indexes and then demonstrate how new goods should be included. The correct price to use for a good in its preintroduction period is the "virtual price," which assumes that demand is zero. Estimating this virtual price requires estimation of a demand function, which in turn provides the expenditure function, which allows exact calculation of the cost-of-living index. The data requirements are extensive, and the need to specify and estimate a demand function for a new brand among many existing brands requires some new econometric methods that may have been obstacles to the inclusion of new goods in the CPI up to this point.

As an example, I use the introduction of a new cereal brand by General Mills in 1989: Apple Cinnamon Cheerios. I find that the virtual price is about twice the actual price of Apple Cinnamon Cheerios. Based on some simplifying approximations, I find that the CPI for cereal may be overstated by about 25 percent because it neglects the effect of new brands.

I then extend the classical theory to the more realistic situation of imperfect competition among multiproduct firms. I then find that the increase in consumer welfare is only 85 percent as high as in the perfect competition case, so that the CPI for cereal still would be too high by about 20 percent.

The Operation and Collapse of Fixed Exchange Rate Regimes

Peter M. Garber and Lars E. O. Svensson

NBER Working Paper No. 4971
December 1994
JEL Nos. F31, F33, F41
International Finance and Macroeconomics

This paper reviews the recent literature on exchange rate target zones and speculative attacks on fixed exchange rates. The influential Krugman model of exchange rate target zones has two main results: credible target zones stabilize exchange rates more than fundamentals (the "honeymoon effect"); and exchange rates depend on fundamentals according to a nonlinear "S-curve" with "smooth pasting." Yet almost all of the model's empirical implications have been rejected overwhelmingly.

Later research has reconciled the theory with the empirical results by allowing for imperfectly credible exchange rates and for intramarginal central bank interventions. That research also has shown that nonlinearities and smooth pasting are probably empirically insignificant, and that a linear managed-float model is a good approximation to exchange rate target zones.

The literature on speculative attack has developed models built on the principles of no anticipated price discontinuities, endogenous timing of the speculative attack, and the attack occurring when a finite amount of foreign exchange reserves remain. These models have been extended to include random timing of attacks and alternative post-attack regimes. In contrast to target zone models, speculative attack models have been influenced by empirical results only to a small extent.

Competition Policy and International Trade

James A. Levinsohn

NBER Working Paper No. 4972
December 1994
JEL No. F10
International Trade and Investment

This paper presents a nontechnical discussion of economic issues that arise because of links between competition (or antitrust) policy and international trade. While recent advances in international trade theory have borrowed heavily from the industrial organization literature, this work has a schizophrenic quality to it. One of the insights that motivated the new trade theory was the observation that many markets were not perfectly competitive. For the case of purely domestic markets, the industrial organization literature provided a foundation for policy advice and most countries now have well-established public policy regarding competition between firms. While trade theorists have borrowed heavily from the theory of industrial organization, they seem to have ignored the existence of competition policy when investigating trade policy. The two interact in important ways, and pretending that trade policy in imperfectly competitive markets takes place in the absence of any competition policy may lead to inadvertent policy outcomes.

Bureaucracy, Infrastructure, and Economic Growth: Evidence from U.S. Cities During the Progressive Era

James E. Rauch

NBER Working Paper No. 4973
December 1994
JEL Nos. D73, H54
Growth, Public Economics

Recent work in the sociology of economic development has emphasized that establishing a professional bureaucracy instead of political appointees is important to the institutional environment in which private enterprise can flourish. I hypothesize that the establishment of such a bureaucracy will lengthen the period that public decisionmakers are willing to wait before realizing the benefits of expenditures. This leads to allocation of a greater proportion of government resources to projects with long gestation periods, such as infrastructure. Using data generated by a "natural experiment" in the early part of this century, when a wave of municipal reform transformed the governments of many U.S. cities, and controlling for the effects of city and time, I find that the adoption of Civil Service increases the share of total municipal expenditure allocated to road and sewer investment. This increased share raises the growth rate of city employment in manufacturing by 0.5 percent per year.

High Tech R and D Subsidies: Estimating the Effects of Sematech

Douglas A. Irwin and Peter J. Klenow

NBER Working Paper No. 4974
December 1994
JEL Nos. O3, L63
International Trade and Investment

Sparked by concerns about their shrinking market share, 14 leading U.S. semiconductor producers, with the financial assistance of the U.S. government in the form of $100 million in annual subsidies, formed a joint R and D consortium, Sematech, in 1987. Using Compustat data on all U.S. semiconductor firms, we estimate the effects of Sematech on members' R and D spending, profitability, investment, and productivity. In so doing, we test two hypotheses: the "commitment" hypothesis, that Sematech obligates member firms to spend more on high-spillover R and D; and the "sharing" hypothesis, that Sematech reduces duplication of member spending on R and D. The commitment hypothesis provides a rationale for the government subsidies, but the sharing hypothesis does not. We find that Sematech did induce members to cut their overall R and D spending by about $300 million per year, which provides support for the sharing hypothesis.

Business Cycles and the Asset Structure of Foreign Trade

Marianne Baxter and Mario J. Crucini

NBER Working Paper No. 4975
December 1994
JEL Nos. F11, F30, F41
International Finance and Macroeconomics

International financial market linkages are believed by many to be important for the international transmission of business cycles, since these linkages govern the extent to which individuals can smooth consumption despite country-specific shocks to income. We develop a two-country, general equilibrium model with restricted asset trade, and provide a detailed analysis of the channels through which these financial linkages affect international business cycles. Our central finding is that the absence of complete financial integration may not be important if the shocks to national economies are of low persistence, or are transmitted rapidly across countries over time. However, if shocks are highly persistent, or are not transmitted internationally, then the extent of financial integration is central to the international transmission of business cycles.

CEO Pay and Firm Performance: Dynamics, Asymmetries, and Alternative Performance Measures

Paul L. Joskow and Nancy L. Rose

NBER Working Paper No. 4976
December 1994
JEL Nos. G3, J3
Industrial Organization

We explore the dynamic structure of the pay-for-performance relationship in CEO compensation, and quantify the effect of introducing a more complex model of firm financial performance on the estimated sensitivity to performance of executive pay. We find that current compensation responds to past performance, but that the effect decays considerably within two years. This contrasts sharply with models of infinitely persistent effects of performance that are implicitly assumed in much of the empirical literature on compensation.

Both accounting and market performance influence compensation. The salary and bonus component of pay has become more sensitive to firm financial performance over the past two decades, as has total compensation. Further, there is no evidence that boards fail to penalize CEOs for poor financial performance, or to reward them dispropotionately well for good performance. Finally, the data suggest that in setting compensation, boards may discount extreme performance—both high and low—relative to performance that lies within some "normal" band.

Is There a "Credit Channel" for Monetary Policy?

R. Glenn Hubbard

NBER Working Paper No. 4977
December 1994
JEL Nos. E4, E5
Monetary Economics

This paper argues that the terms "money view" and "credit view" are not always well defined in theoretical and empirical debates over the transmission mechanism of monetary policy. Recent models of information and incentive problems in financial markets suggest that it is useful to decompose the transmission mechanism into two parts: one related to the effects of policy-induced changes on the overall level of the real costs of funds; and one related to the "financial accelerator" effects stemming from the impact of policy actions on the financial positions of borrowers or intermediaries. My results support the idea that the spending decisions of a significant group of borrowers are influenced by their balance sheet condition. However, whether a bank lending channel is operative is less clear. More micro evidence at the level of individual transactions between borrower and lender is needed to resolve this question.

Do Private Schools Provide Competition for Public Schools?

Caroline Minter Hoxby

NBER Working Paper No. 4978
December 1994
Public Economics

Arguments in favor of school choice depend on the idea that competition between schools improves the quality of education. However, we have almost no empirical evidence on whether competition actually affects school quality. In this study, I use exogenous variation in the availability and cost of private school alternatives to public schools to examine the effects of interschool competition on public schools.

Because low quality in the public schools raises the demand for private schools, we cannot simply compare the outcomes of public school students in areas with and without substantial private school enrollment. Such simple comparisons confound the effect of greater private school competitiveness with the increased demand for private schools in areas where the public schools are poor.

I derive measures of the effect of private school competition from data on religious schools that are less expensive and difficult to set up in areas densely populated by members of the affiliated religion, and represent nine out of ten private school students in the United States. I find that greater private school competitiveness significantly raises the quality of public schools, as measured by the educational attainment, wages, and high school graduation rates of public school students. In addition, I find some evidence that public schools react to greater competitiveness of private schools by paying higher teacher salaries.

Does Competition Among Public Schools Benefit Students and Taxpayers?

Caroline Minter Hoxby

NBER Working Paper No. 4979
December 1994
Public Economics

Many school choice proposals would enable parents to choose among public school districts in their area, but not among private schools. Three reactions to easier choice among public schools are predicted: First, there will be increased sorting of students and parents among schools. Analysts instinctively worry that, with greater sorting, advantaged students will gain at the expense of disadvantaged students.

Second, easier choice will encourage competition among schools, forcing them to be more productive (that is, to have better student performance per input). Third, easier choice among public schools will give parents less incentive to send their children to private schools. However, there is very little empirical evidence to substantiate any of these predictions.

This study attempts to fill that gap. I examine easing choice among public schools using exogenous variation, generated by topography, in the concentration of public school districts in metropolitan areas. I derive measures of concentration based on natural boundaries (rivers) that partially determine district size. I find that easier choice does lead to greater productivity. Areas with greater opportunities for choice among public schools have lower per-pupil spending, lower teacher salaries, and larger class sizes. The same areas have better average student performance, as measured by students' educational attainment, wages, and test scores.

I also find evidence of increased sorting, but no evidence that disadvantaged groups are harmed by that sorting. Improvements in student performance are concentrated among white non-Hispanics, males, and students who have a parent with at least a high school degree. However, student performance is not worse among Hispanics, African-Americans, females, or students who do not have a parent with a high school degree. Also, student performance improves at both ends of the distribution of educational attainment and test scores. Finally, I find strong evidence that a smaller share of students attend private schools in areas where choice among public schools is easier.

Political Constraints on Executive Compensation: Evidence from the Electric Utility Industry

Paul L. Joskow, Nancy L. Rose, and Catherine D. Wolfram

NBER Working Paper No. 4980
December 1994
JEL Nos. L5, L2, G3
Industrial Organization

This study explores the effect of regulatory and political constraints on the level of CEO compensation for 87 state-regulated electric utilities in 1978–90. The results suggest that political pressures may constrain top executive pay levels in this industry. First, CEOs of firms operating in regulatory environments characterized by investment banks as relatively "pro-consumer" receive lower compensation than do CEOs of firms in environments ranked as more friendly to investors. Second, CEO pay is lower for utilities with relatively high or rising rates, or a higher proportion of industrial sales. This is consistent with earlier research that describes political pressures on electric rates. Finally, attributes of the commission appointment and tenure rules affect CEO compensation in ways consistent with the political constraint hypothesis: for example, pay is lower in states with elected commissioners than in states where commissioners are appointed by the governor. Despite apparently effective pressure to constrain pay levels in this sector, however, we find no evidence of related intraindustry variation in the sensitivity of pay to firm financial performance.

The Demand for Post-Patent Prescription Pharmaceuticals

Judith K. Hellerstein

NBER Working Paper No. 4981
December 1994
JEL No. I11
Health Care, Productivity

This paper asks why physicians continue to prescribe trade-name drugs when less expensive generic substitutes are available. I use a dataset on physicians, the multisource drugs they prescribe, and their patients, to study doctors' prescription of generic versus trade-name drugs. I find that almost all physicians prescribe both types of drugs to their patients. However, some physicians are always more likely to prescribe trade-name drugs, while others prescribe generics more often. While much of this behavior cannot be explained by observable characteristics of the physicians or their patients, it appears that patients who are treated by physicians with large numbers of HMO or prepaid patients are more likely to be prescribed generics. There is also a wide regional variation in the propensity of physicians to prescribe generic drugs. I conclude that physicians' behavior regarding prescriptions seems to be based on habit persistence.

Explaining Forward Exchange Bias . . . Intraday

Richard K. Lyons and Andrew K. Rose

NBER Working Paper No. 4982
January 1995
JEL Nos. G15, F31
International Finance and Macroeconomics

Intraday interest rates are zero. Consequently, a foreign exchange dealer can short a vulnerable currency in the morning, close this position in the afternoon, and never face an interest cost. This tactic might seem especially attractive in times of crisis, since it suggests an immunity to the central bank's interest rate defense. However, in equilibrium, buyers of the vulnerable currency typically must be compensated with an intraday capital gain as long as no devaluation occurs. That is, currencies under attack typically should *appreciate* intraday. Using data on intraday exchange rate changes within the European Monetary System, we find that this prediction is borne out.

Implementing Free Trade Areas: Rules of Origin and Hidden Protection

Kala Krishna and Anne O. Krueger

NBER Working Paper No. 4983
January 1995
JEL No. F13
International Trade and Investment

This paper focuses on the effects of rules of origin (ROOs) in Free Trade Areas. We first point out that even rules of origin that are not restrictive, namely those that do not raise the costs of production, have very pronounced effects on trade and investment flows. We then look at some different ways of specifying rules of origin under perfect competition. We compare price- and cost-based ROOs, and show that even if they are equivalent in the long run, they are not equivalent in the short run where capacity constraints can exist. We also show that some kinds of ROOs can be ranked in terms of their implications for producer profits. Further, under certain circumstances, making a ROO more stringent could even raise welfare. Finally, we show that in the presence of imperfect competition, ROOs may raise output and reduce prices as they become more stringent.

Foreign Exchange Volume: Sound and Fury Signifying Nothing?

Richard K. Lyons

NBER Working Paper No. 4984
January 1995
JEL Nos. G15, F31
International Finance and Macroeconomics

This paper asks whether currency trading volume is informative, and under what circumstances. Specifically, I use transactions data to test whether trades occurring when trading intensity is high are more informative—dollar for dollar—than trades occurring when intensity is low. The theory admits both possibilities, depending primarily on the posited information structure. I present what I call a hot-potato model of currency trading, which explains why low-intensity trades might be more informative. In the model, the wave of inventory-management trading among dealers following innovations in order flow generates an inverse relationship between intensity and information content. Empirically, low-intensity trades are more informative, supporting the hot-potato hypothesis.

The Swedish Experience of an Inflation Target

Lars E. O. Svensson

NBER Working Paper No. 4985
January 1995
JEL Nos. E52, F33
International Finance and Macroeconomics, Monetary Economics

This paper gives a brief account of the Swedish experience with an inflation target in a floating exchange rate regime. I identify, document, and discuss the current problems in Swedish monetary policy and their origins. I then consider what can be done to remedy those problems, and draw some general conclusions. The two main current problems are the lack of credibility of the target and the significant risk that the target will be missed. The reasons for the lack of credibility include the fiscal situation, the institutional setup of monetary policy, the political division about monetary policy, and the insufficient transparency of and commitment to the current inflation-targeting policy.

The Effect of Uncertainty on Investment: Some Stylized Facts

John V. Leahy and Toni M. Whited

NBER Working Paper No. 4986
January 1995
JEL No. E2
Economic Fluctuations

The theoretical relationship between investment and uncertainty is ambiguous. This paper briefly surveys the insights that theory has to offer, and then runs a series of simple tests aimed at evaluating the empirical significance of various theoretical effects. Our results from a panel of U.S. manufacturing firms indicate a negative effect of uncertainty on investment, consistent with theories of irreversible investment. We find no evidence for a positive effect via the convexity of the marginal product of capital, and no evidence for the presence of a Capital Asset Pricing Model-based effect of risk.

The Incentive Effects of Property Taxes on Local Government
Edward L. Glaeser

NBER Working Paper No. 4987
January 1995
JEL Nos. H21, R50
Growth, Public Economics

This paper applies the ideas of Brennan and Buchanan (1977, 1978, 1980) to local property taxes. When local governments maximize their revenues, property taxes provide incentives for adequate provision of amenities. Local provision of amenities determines property values, which then determine local tax revenues. As long as the demand for housing is inelastic, property taxes will provide stronger incentives for local governments than lump-sum taxes do. As current property values reflect expectations about future amenity levels, property taxes create incentives for even the most myopic government to invest for the future. Local property taxes also can act to limit the incentives of localities to tax; there are cases in which higher levels of local property taxes lead to lower overall tax burdens. I apply these ideas to the tax reform in the late 1970s; one reason that tax reform may have been so successful is that in a period in which land prices are driven by many forces other than government amenities, property taxes lose their value as incentive devices.

A Dynamic Structural Model for Stock Return Volatility and Trading Volume
William A. Brock and Blake D. LeBaron

NBER Working Paper No. 4988
January 1995
Asset Pricing

We develop a structural model that uses data on asset returns and trading volume to determine whether the autocorrelation in volatility comes from the fundamental being priced by the trading process or from the trading process itself. In the context of our model, the data suggest that persistent volatility is caused by traders experimenting with different belief systems that are based on both past and estimated future profits.

We introduce adaptive agents, in the spirit of Sargent (1993), whose strategies adapt more slowly than the trading process itself. This leads to positive autocorrelation in volatility and volume during the trading process; the positive autocorrelation is caused by persistence of strategy patterns that are associated with high volatility and high volume.

At a rough level, our model is able to reproduce qualitatively the following features of the data: 1) the autocorrelation function of a measure of volatility, such as squared returns or absolute value of returns, is positive with a slowly decaying tail; 2) the autocorrelation function of a measure of trading activity, such as volume or turnover, is positive with a slowly decaying tail; 3) the cross-correlation function of a measure of volatility, such as squared returns, is approximately zero for squared returns with past and future volumes, and positive for squared returns with current volumes; and 4) abrupt changes in prices and returns occur, and are hard to attach to "news." This last feature is obtained by a version of the model in which the Law of Large Numbers fails in the large economy limit.

Historical Factors in Long-Run Growth

The Great Depression
Peter Temin

NBER Historical Paper No. 62
November 1994
JEL Nos. N12, N22

This history of the Great Depression was prepared for *The Cambridge Economic History of the United States.* It describes real and imagined causes of the Depression; bank failures and deflation; the Fed and the gold standard; the start of recovery; the first New Deal; and the second New Deal. I argue that adherence to the gold standard caused the Depression, that abandoning gold started the recovery, and that several of the New Deal measures adopted in the recovery lasted in good order for half a century.

The Price of Housing in New York City, 1830–60
Robert A. Margo

NBER Historical Paper No. 63
November 1994
JEL Nos. N31, N61

The trend in the price of housing before the Civil War is one of many unsolved mysteries of American economic history. The reasons for the mystery are simple. Existing time series of antebellum housing prices are either not true price indexes, or else do not extend back before 1850.

This paper presents new archival evidence on the rental price of housing before the Civil War. The evidence is for the New York City metropolitan area from 1830 to 1860, and is drawn from newspaper advertisements. The advertisement are sufficiently detailed to allow the construction of price indexes that control for some housing characteristics, as well as for location within the metropolitan area.

The most important finding is that the relative price of housing increased between 1830 and 1860. Incorporating the new housing price indexes into existing antebellum cost-of-living deflators (which generally exclude housing) suggests that economic historians have overestimated real wage growth before the Civil War.

A Prelude to the Welfare State: Compulsory State Insurance and Workers' Compensation in Minnesota, Ohio, and Washington

Price V. Fishback and Shawn Everett Kantor

NBER Historical Paper No. 64
December 1994
JEL Nos. H11, G28, N42

Dissatisfied with the high costs of compensating workers for their injuries, seven states enacted legislation in the 1910s requiring employers to insure their workers' compensation risks through exclusive state insurance funds. This paper traces the political–economic history of compulsory state insurance in three states in the 1910s: Minnesota, Ohio, and Washington. State insurance gained broad support in these states because a coalition of progressive legislators took control of their respective legislatures, bringing with them the idea that government had the unique ability to correct imperfections in the market. The political environment in which state insurance thrived in the 1910s provides important insights into the growth of government in the 1930s and 1960s. The major social insurance programs of the New Deal and the Great Society were supported widely at the time because the private market was seen as unable to solve a particular problem, such as unemployment compensation, or poverty in old age. This paper argues that the government's dramatic expansion after the 1932 federal election had precedents; in fact, the ideological roots of New Deal activism were planted during the debates over compulsory state insurance and workers' compensation in the 1910s.

Cliometrics and the Nobel

Claudia Goldin

NBER Historical Paper No. 65
December 1994
JEL No. N0

In October 1993, the Royal Swedish Academy of Sciences awarded the Nobel Prize in Economics to Robert William Fogel and Douglass Cecil North "for having renewed research in economic history." The Academy noted that "they were pioneers in the branch of economic history that has been called the 'new economic history,' or 'cliometrics.'" In this paper, I address what cliometrics is, and how these two Nobel Prize winners furthered the discipline of economics.

Factor Endowments, Institutions, and Differential Paths of Growth Among New World Economies: A View from Economic Historians of the United States

Stanley L. Engerman and Kenneth L. Sokoloff

NBER Historical Paper No. 66
December 1994

Many scholars are concerned with why the United States and Canada have been so much more successful over time than other New World economies. Since all New World societies enjoyed high levels of product per capita early in their histories, the divergence must stem from the achievement of sustained economic growth by the United States and Canada during the eighteenth and early nineteenth centuries, while the others did not manage to attain this goal until the late nineteeth or twentieth centuries. Although many explanations have been offered, this paper highlights the relevance of substantial differences in the degree of inequality in wealth, human capital, and political power in accounting for the variation in the records of growth. Moreover, we suggest that the roots of these disparities in inequality lay in differences in the initial factor endowments of the respective colonies. Of particular significance were the suitability of the country for the cultivation of sugar and other crops, in which there were economies of production in the use of slaves, and the presence of large concentrations of Native Americans. Both of these conditions encouraged the evolution of societies in which relatively small elites of European descent could hold highly disproportionate shares of the wealth, human capital, and political power—and establish economic and political dominance over the mass of the population.

Conspicuously absent from the nearly all-inclusive list of New World colonies with these conditions were the British settlements in the northern part of North America. After demonstrating the importance of the early factor endowments for generating major differences in inequality and in the structure of economies, we call attention to the tendencies of government policies to maintain the basic thrust of those initial conditions, or the same general degree of inequality along the respective economy's path of development. Finally, we explore the effects of the degree of inequality on the evolution of institutions conducive to broad participation in the commercial economy, markets, and technological change during this specific era. We suggest that their greater equality in wealth, human capital, and political power may have predisposed the United States and Canada toward earlier realization of sustained economic growth. Overall, we argue that the role of factor endowments has been underestimated, and the independence of institutional developments from the factor endowments exaggerated, in theories of the differential paths of growth among New World economies.

Technical Papers

Reported Income in the NLSY: Consistency Checks and Methods for Cleaning the Data

Janet Currie and Nancy Cole

NBER Technical Paper No. 160
July 1994
JEL No. C81
Labor Studies

The National Longitudinal Survey of Youth collects information about more than 20 separate components of respondent income. These disaggregated income components provide many opportunities to verify the consistency of the data. We outline the procedures we have used to identify and "clean" measurement error in the disaggregated income variables. After cleaning the income data at the disaggregated level, we reconstruct the measure of "family income" and reevaluate poverty status. While people may not agree with all of our methods, some of them may be useful to other researchers.

We also highlight the value of the disaggregated data; without it, it would be impossible to improve on the reported totals. Finally, we hope that with the advent of computerized interviewing technology, checks on the internal consistency of the data of the kind that we propose eventually may be built into interviewing software, thereby improving the quality of the data collected.

Asymptotically Optimal Smoothing with ARCH Models

Daniel B. Nelson

NBER Technical Paper No. 161
August 1994
JEL No. C32
Asset Pricing

Suppose an observed time series is generated by a stochastic volatility model: that is, there is an unobservable state variable that controls the volatility of the innovations in the series. As Nelson (1992) and Nelson and Foster (1994) show, a misspecified ARCH model often will be able to estimate consistently (as a continuous time limit is approached) the unobserved volatility process, using information in the lagged residuals. This paper shows how to estimate such a volatility process more efficiently using information in both lagged and led residuals. In particular, I expand to smoothing the optimal filtering results of Nelson and Foster, and Nelson (1994).

Asymptotic Filtering Theory for Multivariate ARCH Models

Daniel B. Nelson

NBER Technical Paper No. 162
August 1994
JEL No. C32
Asset Pricing

ARCH models are used widely to estimate conditional variances and covariances in financial time-series models. But how successfully can ARCH models carry out this estimation when they are misspecified, and how can they be constructed optimally? Nelson and Foster (1994) used continuous-record asymptotics to answer these questions in the univariate case. This paper considers the general multivariate case. I am able to construct an asymptotically optimal ARCH model for estimating the conditional variance or conditional beta of a stock return given lagged returns on the stock, volume, market returns, implicit volatility from options contracts, and other relevant data. I also allow for time-varying shapes of conditional densities (for example, "heteroskewticity" and "heterokurticity").

Continuous-Record Asymptotics for Rolling Sample Variance Estimators

Dean P. Foster and Daniel B. Nelson

NBER Technical Paper No. 163
August 1994
JEL No. C32
Asset Pricing

Conditional covariances of asset returns change over time. Researchers adopt many strategies to accommodate conditional heteroskedasticity. Among the most popular are: 1) chopping the data into short blocks of time, and assuming homoskedasticity within the blocks; 2) performing one-sided rolling regressions, in which only data from, say, the preceding five-year period are used to estimate the conditional covariance of returns at a given date; and 3) two-sided rolling regressions that use, say, five years of leads and five years of lags. GARCH amounts to a one-sided rolling regression with exponentially declining weights. We derive asymptotically optimal window lengths for standard rolling regressions, and optimal weights for weighted rolling regressions. As an example, we model empirically the S&P 500 Stock Index.

Evidence on Structural Instability in Macroeconomic Time-Series Relations

James H. Stock and Mark W. Watson

NBER Technical Paper No. 164
September 1994
JEL Nos. C32, E37
Economic Fluctuations

We perform an experiment to assess the prevalence of instability in univariate and bivariate macroeconomic time-series relations, and to ascertain whether various adaptive forecasting techniques successfully handle any such instability. We compute formal tests for instability and out-of-sample forecasts from 16 different models using a sample of 76 representative U.S. monthly postwar macroeconomic time series, constituting 5700 bivariate forecasting relations. The tests indicate widespread instability in univariate and bivariate autoregressive models. However, adaptive forecasting models, in particular time-varying parameter models, have limited success in exploiting this instability to improve upon fixed-parameter or recursive autoregressive forecasts.

Estimating Deterministic Trends in the Presence of Serially Correlated Errors

Eugene Canjels and Mark W. Watson

NBER Technical Paper No. 165
September 1994
JEL Nos. C22, D40
Economic Fluctuations

This paper studies the problems of estimation and inference in the linear trend model: $y_t=\alpha+\beta_t+u_t$, where u_t follows an autoregressive process with largest root ρ, and β is the parameter of interest. We contrast asymptotic results for the absolute value of ρ less than one or equal to one, and argue that the most useful approximations come from modeting ρ as local-to-unity. We derive asymptotic distributions for the OLS, first-difference, infeasible GLS, and three feasible GLS estimators. These distributions depend on the local-to-unity parameter, and on a parameter that governs the variance of the initial error term, κ. The feasible Cochrane–Orcutt estimator has poor properties, and the feasible Prais–Winsten estimator is preferred unless the researcher has sharp a priori knowledge about ρ and κ. We develop methods for constructing confidence intervals for β that account for uncertainty in ρ and κ. We use these results to estimate growth rates for real per capita GDP in 128 countries.

Accounting for Dropouts in Evaluations of Social Experiments

James J. Heckman, Jeffrey Smith, and Christopher Taber

NBER Technical Paper No. 166
September 1994
JEL Nos. C81, C34
Labor Studies

This paper considers the statistical and economic justification for one widely used method (Bloom, 1984) of adjusting data from social experiments to account for dropping out. We generalize the method to apply to distributions, not just means, and then present tests of the key identifying assumption. Reanalyzing the National JTPA experiment base vindicates the application of Bloom's method.

Optimal Prediction Under Asymmetric Loss

Peter F. Christoffersen and Francis X. Diebold

NBER Technical Paper No. 167
October 1994
JEL No. C1
Economic Fluctuations

Prediction problems involving asymmetric loss functions arise routinely in many fields, yet the theory of optimal prediction under asymmetric loss is not well developed. We study the optimal prediction problem under general loss structures, and we characterize the optimal predictor. We then compute the optimal predictor analytically in two leading cases. Analytic solutions for the optimal predictor are not available in more complicated cases, so we develop numerical procedures for computing it. We illustrate the results by forecasting the GARCH(1,1) process, which, although white noise, is nontrivially forecastable under asymmetric loss.

Estimating Multiple-Discrete Choice Models: An Application to Computerization Returns

Igal Hendel

NBER Technical Paper No. 168
October 1994
Productivity

This paper develops a multiple-discrete choice model for the analysis of demand of differentiated products. Users maximize profits by choosing the number of each brand to purchase. Multiple-unit as well as multiple-brand purchases are allowed. These two features distinguish this model from classical discrete choice models that consider only a single choice among mutually exclusive alternatives. I estimate the parameters of the model using the simulated method-of-moments technique. Both requirements of the model—microfoundations and estimability—are imposed in order to exploit the available microlevel data on personal computer purchases. I use the estimated demand structure to assess welfare gains from computerization and technological innovation in peripherals industries. The estimated return on investment in computers is 90 percent. Moreover, a 10 percent increase in the performance-to-price ratio of microprocessors leads to a 4 percent gain in the estimated end user surplus.

Comparing Predictive Accuracy

Francis X. Diebold and Roberto S. Mariano

NBER Technical Paper No. 169
November 1994
JEL Nos. C1, C53
Economic Fluctuations

We propose and evaluate explicit tests of the hypothesis that there is no difference in the accuracy of two competing forecasts. In contrast to tests that were developed previously, ours use a wide variety of accuracy measures (in particular, the loss function need not be quadratic, nor even symmetric), and the forecast errors can be non-Gaussian, not have a zero mean, and be both serially and contemporaneously correlated. We propose, evaluate, and illustrate both asymptotic and exact finite sample tests.

Natural and Quasi-Experiments in Economics

Bruce D. Meyer

NBER Technical Paper No. 170
December 1994
JEL Nos. C1, C9, J00
Labor Studies

Using research designs patterned after randomized experiments, many recent economic studies examine measures of outcome for treatment groups and comparison groups that are not assigned randomly. By using variation in explanatory variables generated by changes in state laws, government draft mechanisms, or other means, these studies obtain variation that is examined readily and is plausibly exogenous. This paper describes the advantages of these studies, suggests how they can be improved, and aids in judging the validity of the inferences they draw. I advocate design complications, such as multiple treatment and comparison groups, and multiple pre- or post-intervention observations.

Testing for Cointegration When Some of the Cointegrating Vectors Are Known

Michael T. K. Horvath and Mark W. Watson

NBER Technical Paper No. 171
December 1994
JEL Nos. C13, C32, F31
Economic Fluctuations,
Monetary Economics

In this paper, we develop tests for cointegration that can be applied when some of the cointegrating vectors are known under the null or alternative hypotheses. We construct these tests in a vector error correction model and motivate them as Wald tests in the version of this Gaussian model. When all of the cointegrating vectors are known under the alternative hypothesis, the tests correspond to the standard Wald tests for the inclusion of error correction terms in the vector autoregression. Modifications of this basic test must be developed when a subset of the cointegrating vectors contains unknown parameters. We derive the asymptotic null distribution of the statistics, determine critical values, and study the local power properties of the test. Finally, we apply the test to data on foreign exchange future and spot prices to test the stability of forward-spot premium.

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