

NBER Reporter

NATIONAL BUREAU OF ECONOMIC RESEARCH, INC.

SUMMER 1993

Program Report

Working Under Different Rules

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For the past four years, many members of the NBER's Program in Labor Studies have been examining how labor markets and income maintenance systems work in the major developed countries: the United States and its trading partners and competitors in the world economy. The "Working Under Different Rules" project, funded largely by a grant from the Ford Foundation, has focused on: the determination of wages and the inequality of wages in different countries (directed by Lawrence F. Katz and me); training of workers (directed by Lisa M. Lynch); income maintenance programs (directed by Rebecca M. Blank); works council modes of worker representation (directed by Joel Rogers and Wolfgang Streeck); and extreme poverty (directed by David E. Bloom). An additional related project, culminating in the book described later in this *NBER Reporter*, contrasted labor markets in Canada and the United States (directed by David Card and me).

On May 7, 1993, the project's leaders presented summaries of the work of their research teams at a conference in Washington, DC. These summaries will be published in a volume titled *Working Under Different Rules*. Also, the research papers written for each of the projects will be published by the University of Chicago Press. My intention in this report is to provide just a brief overview of the entire project.

WHY LOOK AT FOREIGN LABOR MARKETS?

We conceived this project in response to the difficult time that many American workers have had in the past two decades. Real wages have fallen for the less-educated worker. Inequality in earnings and employment opportunities among workers with different characteristics has increased. Unionism in the private sector has

In This Issue

Program Report: Working Under Different Rules	1
Research Summary:	
Pricing in the U.S. Pharmaceutical Industry	7
NBER Profiles	9
Conferences	11
Bureau News	19
Bureau Book	31
Current Working Papers	31

This issue of the *Reporter* highlights the "Working Under Different Rules" project of the Bureau's Program in Labor Studies. Next, Ernst R. Berndt and Zvi Griliches describe their research on pricing in the U.S. pharmaceutical industry. After biographical sketches, news of NBER conferences, and other NBER news and reports, the *Reporter* concludes with short summaries of recent Working Papers.

declined. And, poverty has increased for large segments of the population, although not among the elderly.

Of course, the 1980s were difficult for workers in much of Europe and in Canada as well. In those countries, unemployment went from below to above U.S. levels. Perhaps even more important, unlike in the United States, unemployed people remained jobless (albeit with relatively generous benefits that partially induced the longer unemployment spells) for several years. For instance, 6 percent of the unemployed in the United States in 1991 were out of work for a year or more, compared to 37 percent in France, and 51 percent in Spain. The contrasting unemployment experiences of the United States and Europe in the 1980s generated widespread discussion of the American jobs miracle, and of the virtues of "flexibility American style." Some observers thought that the United States had all the "answers" to the economic problems of the 1980s, and that Europe had much to learn from us, while we had nothing to learn from them.

The basic premise of our project was more measured: that while the United States had some positive outcomes in the labor market in the 1980s, it also had some negative ones. Thus, perhaps there was some-

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Preparation of the *NBER Reporter* is under the supervision of Donna Zerwitz.

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thing Americans could learn from the labor market experiences and the social programs of Europe, Japan, and Canada.

FINDINGS

Wage Inequality

Is the U.S. pattern of rising wage differentials and wage inequality among workers with different levels of education a universal development in advanced capitalist economies? Or, have some countries not experienced huge increases in wage inequality? The evidence collected for the 1980s shows that increases in wage inequality were most substantial in the United States and Great Britain. Because the increased inequality in Britain occurred while real wages were rising, low-paid British workers actually realized modest increases in their real wages over the decade. By contrast, low-paid American workers had sizable decreases in their real wages.

Wage inequality rose, but by much less, in Canada, Japan, and in continental Europe. Inequality barely changed in France and Italy, fell in the Netherlands, and rose much less in Sweden and Germany than in the United States. Nowhere did the ratio of the earnings of college graduates to less-educated workers rise as much as in the United States. Indeed, earnings differentials by education actually declined in the rapidly growing Korean economy during the same period.

What differentiates countries with wage differentials that are increasing slightly, or stable, from countries such as the United States, which experienced large increases in inequality? Basically, three things: (1) countries with fairly stable wage differentials place more emphasis on wagesetting institutions than the United States does; (2) they also either have maintained the strength of unions or have experienced smaller declines in unionization than the United States; and (3) they have a better training system for their less-educated workers.

Many European countries have wage-setting systems that are relatively centralized, either because of government policies or because of strong trade unions. In some countries, the government extends contracts from union to nonunion workers; this makes collective bargaining the key to wage determination, even with only moderate or modest union representation. In both Germany and France, for example, the ministers of labor extend contracts negotiated between employer federations and unions to all employers in that particular sector. The French rely heavily on the national minimum wage in setting wages for all workers. Wagesetting in Italy and Sweden is relatively centralized, too. Italy's *Sscala Mobile*, a centrally negotiated wage for low-paid workers, pushed up the bottom of the earnings distribution in

Italy in the 1980s. In Sweden, bargaining between the main employers' federation and the main blue collar union federation reduced wage inequality through 1983. But centralized wagesetting weakened in Sweden later in the 1980s, and earnings differentials began to widen.

The extent of union representation of workers also influences wage inequality. Both the United States and the United Kingdom had large declines in union penetration and, as noted, large increases in wage inequality during the 1980s. By contrast, Canada maintained a high level of union density and had smaller increases in inequality. Much of the greater rise in inequality in the United States than in Canada is attributable to the continued strength of Canadian unions.

Changes in the *supply* of workers with different levels of education also contributed to the differing trends in wage inequality. In the United States, growth of the college-educated work force decelerated greatly in the 1980s. By contrast, Canada and the Netherlands had sizable increases in the number of college graduates relative to high school graduates in the work force. As a consequence, Canada had only modest increases in the college-high school wage differential, and the Netherlands had modestly declining wage differentials.

In every country that we examined, the change in the relative supplies of workers with certain levels of education influenced relative wages. We would expect shifts in the industry or occupation mix of a country's demand for labor in favor of more-skilled workers to improve the relative earnings of those workers, too. But these shifts do not appear to have contributed substantially to the different trends in earnings inequality across countries. That is because all of the countries we study had similar shifts, favoring the more educated. Only in Japan and Korea do shifts in industry structure—notably the continued strength of manufacturing employment—help to account for their distinct change in relative wages.

Worker Training

Worker training differs across countries in many ways. Some countries base their training systems largely on the firm. Other countries rely more on government training programs, or on school-based or individual training decisions. Evidence on the returns to training for individuals in the form of wages, and for firms in the form of productivity, suggests that company-based training has the highest payoff. Presumably this is because it is linked more directly to the skills needed at the particular workplace. By contrast, informal "learning by doing" raises worker productivity in the short run but not in the long run. Government-led and school-based job training systems have only marginal effects on wages.

How do countries develop a successful firm-based training system? Germany and Japan are exemplary, and their experiences show that such a system requires

considerable institutional support. In Germany, unions and works councils help to determine the content of training in apprenticeship programs. Upon completion of a program, trainees receive national certificates of skills. In addition to certification, the government provides schooling that complements the workplace training. Finally, government regulations make it costly to hire young people from outside of the apprenticeship system; local chambers of commerce also exert pressures against firms "poaching" trained workers.

In Japan, there is little mobility of labor in and out of large firms, but workers rotate jobs within firms. Thus, workers build skills in a variety of broadly defined jobs at a company. Furthermore, all high school graduates have mastered similar skills, and there are strong links between firms and schools. So a worker's performance in high school is the key to obtaining a job with a good firm that provides workplace training. Thus, the lesson from both Germany and Japan is that developing a good workplace-based training system requires a range of institutional support, from schools, government, and so on.

Do differences in training systems contribute to the different trends that we observe in inequality of earnings or in productivity growth? Our estimates show that formal firm-based training pays off in terms of earnings. Evidence on who gets training across countries shows that in the United States, most firm training programs are for white collar and educated workers. The limited training for blue collar workers is more remedial here than in other countries. Since training builds skills, and the more skills high school graduates have, the better they can compete with more-educated workers, it is likely that the better-trained, less-educated workers in, say Germany or Japan, are closer substitutes for college graduates than in the United States. Thus, when the job market favored more educated workers in the 1980s, there was less pressure for changes in earnings differentials in those countries than in the United States.

Worker Representation

In the United States, unions are the sole form of worker representation. But in recent years, union representation in the private sector has fallen to 11 percent of the workplace—comparable to its level before the New Deal. The National Labor Relations Board has frowned on company-sponsored committees of workers, viewing them as an anti-union device. So, many American workers are without a voice at their firms.

In contrast, all continental European countries have legally mandated works councils inside firms. How do these councils operate? The particulars of works councils differ across countries, but they have several common features.

In Europe, works councils are mandated legally in all firms above a given size. However, this does not mean

that a government regulator forces councils onto firms whose workers and management do not want them; rather, either side can insist upon their formation. Works councils have legal rights to information about the performance of the firm as it relates to labor issues. They also have rights to "consultation" about changes in labor and personnel policies.

In Germany, but not elsewhere in Europe, the councils have the right to settle disputes with management by arbitration. In Canada, works councils deal solely with occupational health and safety issues. The mode of choosing workers to sit on a council is left to the enterprise, with the requirement that councilors be "representative." In all countries except Spain, councils cannot strike and do not negotiate wages.

During the 1980s, when union membership fell in many countries and union influence declined in almost all countries, works councils flourished. In Canada, both management and labor agree that mandated health and safety councils have been superior to government regulation in overseeing workplace health and safety. In France, where unions are in disarray; in Italy, where many institutions are in disarray; and in Germany and Belgium, where unions remain strong, works councils provide a forum for cooperative labor-management relations and a place for workers to voice concerns and influence management decisions.

The general consensus for the countries studied in the NBER project is that councils help to create productive labor relations. This is true both where management has an extensive influence on councils, as in France, and where unions have an extensive influence on councils, as in Germany. Moreover, the growing role of councils in European countries with very different union and labor systems, and in a period when unionism is waning, suggests that they are a "robust" institutional form for labor-management relations. The councils seem more suited for dealing with the ongoing decentralization of collective bargaining and for building worker voice within enterprises than many traditional trade unions are.

Income Maintenance and Social Insurance Systems

Many economists and social observers, unfamiliar with the equivocal evidence for the widely studied American welfare system,¹ have blamed the more extensive income maintenance systems and employment regulations of Western Europe for continued high unemployment and related economic ills. There are some fairly clear examples of poorly constructed programs, including sick leave in Sweden, which have had substantial

adverse effects on working; and of unemployment insurance programs that extend periods of joblessness. But our study of a host of different programs in different countries shows that, in general, these programs do not have major efficiency costs.

One reason is that many European programs require people to work in order to receive benefits. In France, for instance, the combination of time limits on welfare payments and the availability of public daycare leads many single women to leave welfare and go to work when their child reaches age three. In Sweden, employer benefits such as maternity leave are generous, so single mothers are more likely to have worked before they have a child. Other European programs, such as tenant protection or subsidies for homeownership, primarily affect residence decisions and have only a minor impact on labor mobility.

Another reason that European social programs do not necessarily have a negative effect is that firms or individuals find ways around them. For instance, employment security laws in Germany, France, and Belgium force firms to adjust their number of employees more slowly than they might like when market conditions change. But firms in these countries simply adjust the hours each employee works instead.

In Spain, there is considerable noncompliance with high payroll taxes mandated to pay for health care. In firms that evade those social security taxes, the workers are like American workers who do not have employer health coverage. However, most of the Spanish workers have family members in a firm that pays the social security taxes. Thus, those firms end up providing health care for the entire family.

In an attempt to increase labor market flexibility, several European countries sought to reform their income maintenance and employment regulations in the 1980s. Their success was marginal at best, and did not "cure" the European unemployment problem: unemployment in Great Britain was at least as high after Mrs. Thatcher's reforms as before. Both our studies of specific programs and the recent historical experience suggest that social protection programs should not be judged by their secondary effects on aggregate economic performance. Assessing these programs involves comparing how well they accomplish their goals as compared to their costs, which include the potential distortionary costs that result from their changing incentives in undesirable ways.

Extreme Poverty²

The failure of the United States to alleviate the problems of very poor people—those in the bottom 5 percent or so of the income distribution—stands in sharp con-

¹R. A. Moffitt, "Incentive Effects of the U.S. Welfare System: A Review," *Journal of Economic Perspectives* 30, 1 (March 1992), pp. 1-61.

²The extreme poverty project, directed by David E. Bloom, is still in its working phase. The results cited here are based on preliminary papers.

trast to its general economic success. Despite our high standard of living, the very poor are worse off in absolute terms here than in other countries. Those at the very bottom of the income distribution appear to be affected very little by overall income growth or the median level of income. Specific policies toward these people, not general economic growth, seem to be the only way to solve their problems.

But well-meaning policies do not always work. For example, Australia's generous funding for aborigines living in their native areas seemingly backfired by inducing low labor participation and extensive social problems. In contrast, European countries with welfare systems that require work to get benefits have managed to keep female-headed households out of extreme poverty. In part, this is because women in those countries who have out-of-wedlock births tend to do so later in their lives than American women do, after they have received an education or some work experience.

LESSONS FOR THE UNITED STATES

The "Working Under Different Rules" project had two main goals. First, we wanted to discover whether other advanced countries had labor market problems similar to those plaguing the United States. Then, we hoped to learn which policies or institutions had enabled those countries to overcome the labor market problems we share.

We found that some changes have been more substantial in the United States than elsewhere—the rise in income inequality and the loss of worker representation—and that extreme poverty is greater in the United States than in other countries. Since other countries have coped better than the United States with the shift in demand for labor away from less-skilled workers, with union weakness, and with the difficulties of the very poor, we learned at a minimum that these problems are not inexorable and irremediable. Even the modest differences in income maintenance policy between the United States and Canada—a stronger unemployment benefit system and family income maintenance system in Canada—greatly affect the poverty rate, for example. And the modest differences in labor law between the United States and Canada account for at least some of the differing pattern of unionization in the two countries, with consequences for income inequality.

We also found that most social protection programs have only modest side effects on the efficacy of the labor market in Europe. Programs that require people to work before being eligible for benefits minimize the risk that people will choose to take government aid rather than working. The primary effects of many European programs are on the well-being of the people they were designed to help. Given this, it is not surprising that the

diverse European efforts to solve unemployment by weakening labor regulations, enhancing labor market flexibility, and reducing the welfare state have not worked, at least not yet.

We observed that the effects of specific programs and institutions depend on the environment of other institutions and policies in which they operate. German and Japanese training institutions, in particular, require considerable institutional support to be successful. Thus, we learned that a set of interrelated programs has a greater chance of succeeding than a single program designed to resolve a given problem.

We also note that the experience of countries in the 1980s is consistent with two potential trade-offs. First, countries such as the United States that had a poor record in productivity and real wage growth had better experiences with employment. Except for Japan, no country managed to do well on both of these levels. Second, countries that maintained stable wage distributions had worse experiences with employment (again excluding Japan). This suggests a second possible trade-off—between income inequality and employment—in an era when market forces favored the better educated. The notion that any country has a "lock" on the right institutions or policies is simply not true, although the Japanese, as we all know, have an enviable growth record.

Specific papers in the "Working Under Different Rules" project reported on some successful and some unsuccessful labor market and income maintenance programs outside the United States. Of particular import for the United States are welfare programs that require or encourage, rather than discourage, work; and institutions that buttress training for less-educated workers. Of course, the United States has distinct features that make it infeasible to "import" foreign practices. What works in Japan, or Europe, or Canada, may not fit with American social and economic practices. And, it is logically possible (although unlikely) that what fails in some other advanced country might work here. Still, a solid body of information about foreign experiences does provide insights for the design of institutions or programs that might better our situation.

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Research Summary

Pricing in the U.S. Pharmaceutical Industry

Ernst R. Berndt and Zvi Griliches

There is a long history of measurement and analysis of productivity growth at the NBER. In recent years, several members of the NBER's productivity program have begun to focus on the measurement of price changes in the U.S. pharmaceutical industry as a way of assessing the accuracy of government price and productivity measurement.

Although the worldwide slowdown in productivity growth dates back about 20 years, we know surprisingly little even today about its causes. For some time, we have been suspicious of the reliability of official government statistics on growth in output and productivity, and we have conjectured that some of the reported slowdown may reflect difficult measurement problems. In particular, while government officials typically are able to obtain reasonably reliable data on sales, decomposing changes in sales into their price and quantity compo-

nents is a rather difficult task. That is particularly true when the number of new goods increases, when forms of retailing change (for example, to increased mail order purchases), and when quality changes.

Given the fact that the value of sales equals a price index times a quantity index, any errors in calculating a price index imply corresponding errors in the quantity index. If inflation is overestimated, then growth in real output must be understated. But, how might we assess the accuracy of widely used price indexes, such as the Producer Price Index (PPI)?

We decided to audit a single industry in considerable detail. Although some of our earlier work focused on adjusting for quality the price indexes for personal computers,¹ we chose the prescription pharmaceutical industry this time (NBER Faculty Research Fellow Joshua Rosett was also a participant). We selected that industry in part because it apparently experienced a sharp slowdown in productivity growth in the 1970s. It also has seen considerable technological change (and therefore there are possibilities for measurement error); its pricing policies have been the focus of considerable public attention; and it has other interesting attributes (for example, it is heavily engaged in research and development, and enjoys protection under the U.S. patent system). Moreover, we were able to obtain microdata on a confidential basis from four major U.S. pharmaceutical companies.

Soon, though, we encountered a mystery. From January 1984 through December 1989, the Bureau of Labor Statistics (BLS) price index for prescription pharmaceutical preparations grew at an annual rate of 9.09 percent. We compared this official data to monthly price and quantity sales data on all 2090 prescription products sold by four major U.S. pharmaceutical manufacturers, accounting for about 24 percent of total domestic industry sales in 1989. Using procedures that mimicked those employed by the BLS (weighting a select number of products by the same factor over time, known as a Laspeyres index), we found that over the same time period, the four-company price index increased at only 6.68 percent per year. Moreover, when we used an index procedure that changed over time reflecting evolving market shares (a Divisia index), the aggregate four-firm price index grew at only 6.03 percent per year. Thus, the focus of our initial research was why the BLS price index grew approximately 50 percent more rapidly than our lower estimate.²

¹See E. Berndt and Z. Griliches, "Price Indexes for Microcomputers: An Exploratory Study," in *Price Measurements and Their Uses*, M. Foss, M. Manser, and A. F. Young, eds. Chicago: University of Chicago Press, 1993, pp. 63-93.

²See E. Berndt, Z. Griliches, and J. Rosett, "Auditing the Producer Price Index: Micro Evidence from Prescription Pharmaceutical Preparations," *Journal of Business and Economic Statistics* 11, 3 (July 1993), pp. 251-264.

We were most concerned about the representativeness of our four-company sample. In cooperation with BLS officials, we obtained the four companies' records of the prices they had initially reported for the products sampled by the BLS. We learned that the rates of price increase for those products grew at an annual rate of 8.94 percent, virtually the same as the reported overall growth in the official PPI. Hence the discrepancy apparently was not caused by these four companies being unrepresentative.

Moreover, when we obtained data from a private sector source (IMS America, Inc.) covering virtually the entire population of one subclass of pharmaceutical products (systemic anti-infectives), we found that while the official PPI for this subclass grew at an annual rate of 6.26 percent, the growth rate based on IMS data grew at only 2.63 percent per year.

After eliminating "list versus transactions prices" and "company weights versus BLS weights" as explanations, we discovered that the age distribution of products sam-

"The BLS undersampled younger drugs with below-average price increases, and oversampled medium-aged drugs with above-average price rises."

pled by the BLS tended to be much more concentrated than the age distribution for products at our four companies. Moreover, the BLS tended to undersample newer drugs (from zero to four years old), and considerably oversample medium-aged drugs (four to ten years old).

We also found that while prices of younger drugs tended to grow about 3.5 percent slower per year than older (over age 25) drugs, prices of medium-age drugs tended to grow about 2.5 percent *faster* than older products. Hence, we discovered that a major determinant of the discrepancy in growth rates between the four-company and the BLS price indexes was the fact that the BLS undersampled younger drugs with below-average price increases, and oversampled medium-aged drugs with above-average price rises.

We also examined the impact of very new drugs on aggregate price measures. Differences between the average annual growth rates of price indexes based on the fixed-weight price index and the evolving market share index were rather modest when computations were undertaken over an identical set of goods. However, when the set of goods included in the computations immediately incorporated new and relatively young products, the resulting market share indexes grew at a considerably lower rate than did the fixed-weight index that excluded these new goods. We concluded that in the U.S. pharmaceutical industry, new and relatively young goods play a significant role. Failing to incorporate new goods promptly into the price index calculations results in substantial overestimates.

Our study entirely neglected one very important issue: the role of generic drugs. In the context of pharma-

ceuticals, the issue is how to link a post-patent generic drug to its patented antecedent. The U.S. Food and Drug Administration (FDA) certifies a variety of a previously existing drug as being "(bio-)equivalent" to the previously available patented version. The generic differs only in packaging, including the inert matter enclosing the active ingredients, in labeling, and in source. Thus, from the point of view of the FDA, generics and branded drugs are perfectly substitutable.

Generic drugs enter the market after the patent on a drug expires, and typically sell at a considerable discount relative to their patented antecedent. Moreover, it is not uncommon for branded drugs to increase in price after their patent has expired. On a prescription basis, generic drugs today constitute a very substantial and growing portion of the marketplace. But the fact that generic drugs and branded drugs coexist in the marketplace, selling at different prices, suggests that from an economic point of view they are not viewed as perfect substitutes by all purchasers.

Although the FDA treats generic and antecedent patented drugs as being bioequivalent, the BLS treats a generic drug as being entirely unrelated to its patented antecedent. Therefore the BLS does not incorporate into its overall price index the effects of the substantial growth over time in the market share of lower-priced generics. But precisely how one should incorporate generics into the price index, and by how much the resulting index would differ from the one based on current BLS procedures, is not at all clear.

Griliches and NBER Faculty Research Fellow Iain Cockburn have examined the empirical implications of incorporating generic drugs into the aggregate price index in several different ways.³ They stress that traditional index number theory is not particularly informative in this context because it is based on the notion of a representative consumer, while the substantial but less-than-complete market penetration by generics suggests that this market is segmented into at least two groups, one considerably more price-sensitive than the other. Making a variety of assumptions concerning the heterogeneity of consumers' preferences, they examine case studies of two anti-infective drugs: cephalexin and cephradine. They find that in the case of cephalexin "BLS approach" yields an increase in the producer price index of about 14 percent over the 45 months observed in the data. The "FDA approach," in contrast, based on the assumption that branded and generic versions are perfect substitutes, yields a price *decline* of 53 percent. Using an "adjusted Paasche" index that the authors prefer generates a price index that falls by 48 percent.

Griliches and Cockburn conclude by urging official statistical agencies to move quickly toward a more cur-

³Z. Griliches and I. Cockburn, "Generics and New Goods in Pharmaceutical Price Indexes," NBER Working Paper No. 4272, March 1993.

rent sampling of new products, and to incorporate generic drugs into official price indexes by adopting some form of compromise linking generic drugs with their patented antecedents. In fact, the BLS has announced that it will be implementing several of these recommendations on an experimental basis beginning in 1994.

A number of other projects dealing with related aspects of the pharmaceutical industry are currently underway. Berndt and Stan Finkelstein (of the MIT Program on the Pharmaceutical Industry) are examining possible uses of hedonic price analysis to control drug prices for quality change, using data on selected antihypertensive drugs. NBER Faculty Research Fellow Valerie Y. Suslow also is assessing quality-adjusted prices, using data from the antiulcer drug market.

Sara Fisher Ellison, who is working with Griliches, Cockburn, and NBER Research Associate Jerry A. Haus-

"The 'BLS approach' yields an increase in the producer price index of about 14 percent over the 45 months observed in the data. The 'FDA approach,' in contrast, based on the assumption that branded and generic versions are perfect substitutes, yields a price decline of 53 percent."

man, is attempting to model and measure own- and cross-price elasticities for a number of chemically distinct but therapeutically equivalent drugs—drugs that could be prescribed for the same condition (as distinguished from generic drugs that are chemically equivalent to their patented antecedents). In related work, Ellison is analyzing a consumer demand model with heterogeneous consumers. She also is analyzing the information content of advertising and marketing for pharmaceutical

products in the market for antiulcer drugs.

Finally, Judy Hellerstein currently is modeling physicians' decisions to prescribe generic versus branded drugs. She looks at both patient and physician characteristics, and the probability that a physician is aware of the presence of generic substitutes.

As can be seen, the NBER research on the pharmaceutical industry has taken on a life of its own, even though its original stimulation came from an interest in the reliability of official price deflator data. In a future article, we hope to be able to report not only on the results of various demand-related issues in the pharmaceutical market, but we also hope to return to our original focus and report implications of these various studies for the measurement of output and productivity growth in technologically dynamic industries such as the U.S. pharmaceutical industry. It is possible that the U.S. economy was considerably more productive in the last decade than is now thought.

Profiles

Ernst R. Berndt

Ernst R. Berndt has been a research associate in the NBER's Program in Productivity and Technical Change since 1980, and is professor of applied economics at MIT's Sloan School of Management.



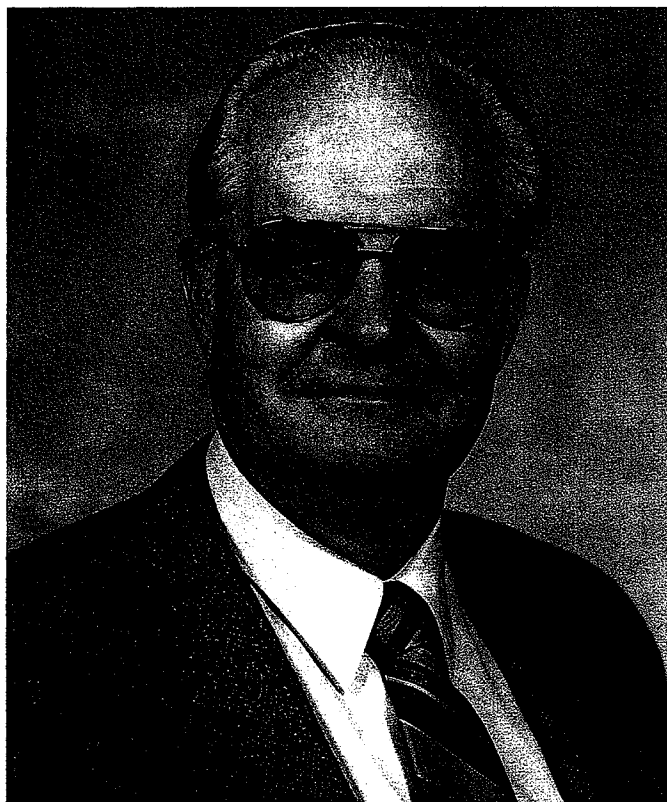
Berndt received his B.A. from Valparaiso University and his M.S. and Ph.D. from the University of Wisconsin, Madison. He taught economics at the University of British Columbia from 1973 until 1980 before joining the MIT faculty. He also has been a visiting professor at Stanford University and at the Harvard Business School.

Berndt is a member of the Executive Committee of the NBER's Conference on Income and Wealth, and has been on the editorial boards of numerous journals. His work on applied econometrics, energy, regulation, and productivity has been published in journals and books. In 1991, he was awarded an honorary doctorate from Uppsala University in Sweden.

Berndt lives in Lexington, and has two college age sons—Jeff, at the University of New England, and Nathan, at MIT. He likes classical music, jazz, and "sick jokes."

Rueben C. Buse

Rueben C. Buse has represented the American Agricultural Economics Association, of which he is currently executive secretary, on the NBER's Board of Directors since 1990. He is also a professor of agricultural economics at the University of Wisconsin, Madison.



Buse received his B.A. and M.S. from the University of Minnesota, and his Ph.D. from Pennsylvania State University. He joined the University of Wisconsin faculty in 1959, and was named a full professor in 1969. In addition, he was a visiting professor in the department of economics at the Federal University of Rio Grande do Sul in Brazil from 1962–5. He also has served as an advisor to the Brazilian USAID Mission and the Brazilian Ministry of Planning and Agriculture.

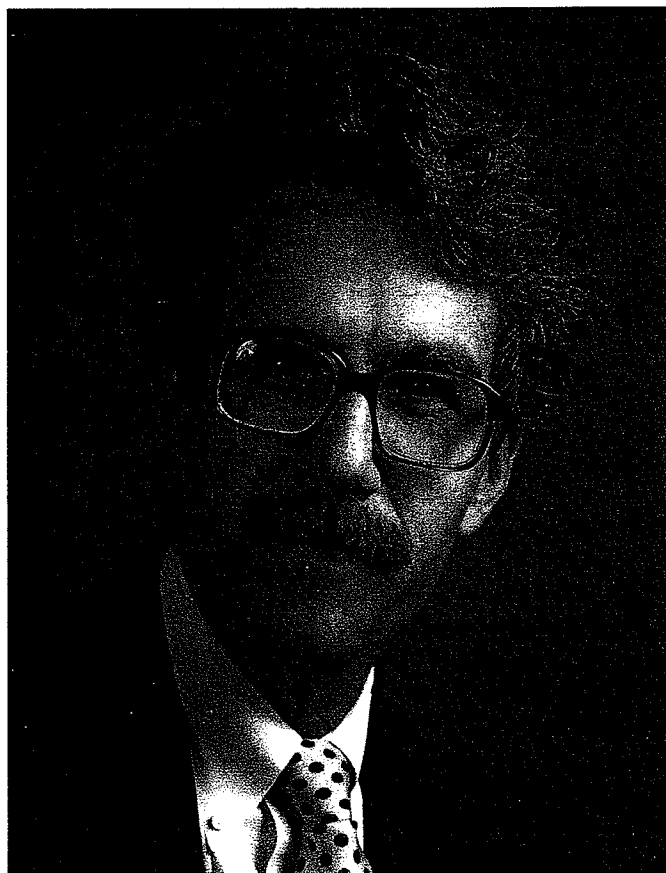
Buse's research, which currently focuses on the influence of socioeconomic variables on consumer expenditure patterns, has been published in numerous books and journals. He is also the editor, with James Driscoll, of *Rural Information Systems: New Directions in Data Collection and Retrieval*, published in 1992 by the Iowa State University Press.

Buse and his wife, Norma, have five children and seven grandchildren. In addition to home repair, Buse enjoys fishing, reading, and weekend touring on his Honda Aspencade motorcycle.

Craig E. Swan

Craig E. Swan has served on the NBER's Board of Directors since 1990. He is professor of economics at the University of Minnesota, and became chairman of the economics department in 1992.

Swan received his B.A. from the University of California, Berkeley, and his M.A. and Ph.D. from Yale University. He joined the University of Minnesota faculty in 1969 as an assistant professor, was promoted to associate professor in 1974, and became a full professor in 1986. In addition, he served as associate dean of the university's College of Liberal Arts from 1983–9. Swan's research on housing has been published in numerous scholarly journals. In addition, he was president of the Minnesota Economics Association in 1985–6, and an associate editor of *Housing Finance Review* from 1980–9.



Swan's wife, Janet, is a librarian at the Federal Reserve Bank of Minneapolis. Their two children, Andrew and Alice, are college students. Swan's hobbies include reading, cross-country skiing, and running.

Eighth Annual Conference on Macroeconomics

The NBER's Eighth Annual Conference on Macroeconomics took place in Cambridge on March 12 and 13. Organizers Olivier J. Blanchard and Stanley Fischer, both of MIT, selected the following papers for discussion:

Robert S. Pindyck, NBER and MIT, and **Andrés Solimano**, World Bank, "Economic Instability and Aggregate Investment"

Discussants: **Janice Eberly**, University of Pennsylvania, and **Robert E. Hall**, NBER and Stanford University

Anton Braun and **Ellen McGrattan**, Federal Reserve Bank of Minneapolis, "The Macroeconomics of War and Peace"

Discussants: **Julio J. Rotemberg**, NBER and MIT, and **J. Bradford De Long**, NBER and Harvard University

Alan Gelb and **Inderjit Singh**, World Bank, and **Gary Jefferson**, Brandeis University, "Can Communist Economies Transform Incrementally? The Experience of China"

Discussants: **Dwight Perkins**, Harvard University, and **Jeffrey D. Sachs**, NBER and Harvard University

Gilles Saint-Paul, DELTA, "On the Political Economy of Labor Market Flexibility"

Discussants: **Andrew Atkeson**, NBER and University of Chicago, and **Robert M. Solow**, MIT

Ricardo J. Caballero, NBER and MIT, and **Adam B. Jaffe**, NBER and Harvard University, "How High Are the Giants' Shoulders? An Empirical Assessment of Knowledge Spillovers and Creative Destruction in a Model of Economic Growth" (NBER Working Paper No. 4370)

Discussants: **Philippe Aghion**, MIT, and **Ariel Pakes**, NBER and Yale University

John Boyd, Federal Reserve Bank of Minneapolis, and **Mark Gertler**, NBER and New York University, "U.S. Commercial Banking: Trends, Cycles, and Policy"

Discussants: **Fischer Black**, Goldman Sachs & Co., and **Martin Feldstein**, NBER and Harvard University

Pindyck and **Solimano** find that the volatility of the marginal profitability of capital—a summary measure of uncertainty—has a moderate effect on investment, particularly in developing countries. This volatility has little correlation with political or economic instability. It is highly correlated with inflation, though, and inflation explains investment well, the authors find.

Braun and **McGrattan** focus on the two world wars in order to isolate the effects of government purchases on GNP and the labor market. After documenting the British and U.S. wartime experiences, they find that the neoclassical growth model explains many of the facts after the effects of government investment and conscription are taken into account. In particular, that model predicts the contemporaneous increases in average productivity and hours observed in the United States as well as the decline in hours observed in Great Britain.

Gelb, **Jefferson**, and **Singh** examine China's generally successful incremental transition experience. Against a background of macroeconomic stability, management reform in state enterprises, dual pricing, and partial trade liberalization enabled China to "grow out of the plan" and shift its "institutional efficiency frontier" toward international best practice. The authors conclude that, during the 1980s, ownership diversification, entry, and competition, principally within the public sector, and links to Hong Kong and Taiwan, led to a more efficient and dynamic but less profitable industrial sector. Sustained progress during the next decade will require banking reform, more efficient and uniform taxation, and clarification of property rights with attention to income distribution, which appears to have deteriorated following initial gains during the early agricultural reforms.

Saint-Paul states that, despite the very high level of unemployment in major European countries, the resources devoted to fight it are very small. This suggests that there is little political concern about high unemployment. He develops a model in which the government tries to increase employment by increasing labor market flexibility, and in which any reform must pass by a majority. The employed will block a complete reform of the labor market, however. In the long run, when a two-tier system prevails, political support gradually will build up in favor of further increases in flexibility.

Caballero and **Jaffe** estimate that the average annual rate of creative destruction—that is, successful inventions eventually being superseded by others—ranged from 3 to 7 percent in the 1970s, with rates for individual sectors as high as 25 percent. They find that technological obsolescence increased from about 3 percent per year to about 12 percent per year over the century end-

“Technological obsolescence increased from about 3 percent per year to about 12 percent per year over the century ending in 1990.”

ing in 1990, with a noticeable plateau in the 1970s. The rate of diffusion of knowledge is quite rapid, they estimate, with the mean lag between one and two years. Using patent citations to trace the use of old knowledge in the generation of new ideas, they find that "effective knowledge spillovers" have declined since 1960 in a way that is quite consistent with the observed decline in the average productivity of research.

Boyd and Gertler pinpoint sources of recent problems in U.S. commercial banking in order to provide a context for evaluating policy options. They document how increased competition and financial innovation made banking less stable in the 1980s. Then they identify the specific sources of the industry's difficulties over this decade. The poor performance by large banks provided the main stress on the system, they find. This poor performance was the product of increased competition for the industry and of a regulatory system that provides greater subsidies to risk taking by large banks relative to the industry mean.

These papers and the discussion that followed them will be published by the MIT Press in November as *NBER Macroeconomics Annual: Volume 8, 1993*.

International Savings Comparison

Economists from seven major industrial countries met on March 18–20 at an NBER conference comparing savings internationally. James M. Poterba of NBER and MIT organized the program:

Personal Saving in North America

John Burbidge, McMaster University, and **James Davies**, University of Western Ontario, "Household Data on Saving Behavior in Canada"

Orazio P. Attanasio, NBER and Stanford University, "Personal Saving in the United States"

Discussant: **David A. Wise**, NBER and Harvard University

Personal Saving in Japan

Yukinobu Kitamura, Bank of Japan, and **Noriyuki Takayama**, Hitotsubashi University, "Household Data on Saving Behavior in Japan"

Discussant: **Martin Feldstein**, NBER and Harvard University

Personal Saving in Europe

James Banks and **Richard Blundell**, Institute for Fiscal Studies, "Household Saving Behavior in the United Kingdom"

Axel Börsch-Supan, NBER and University of Mannheim, "Personal Saving in Germany"

Tullio Jappelli, Istituto Universitario Navale, (Naples) and **Marco Pagano**, Bocconi University, "Personal Saving in Italy"

Discussants: **Laurence J. Kotlikoff**, NBER and Boston University, and **Jonathan S. Skinner**, NBER and University of Virginia

Burbidge and Davies summarize Canadian microdata on income, consumption, saving, and wealth over the life cycle. They find that all of these variables and their components depend on age. Of all the variables studied, though, rates of saving out of disposable income are least dependent on age: variation within the cohort appears to be more important than age. This suggests that tax policies that redistribute income primarily within rather than across age groups are more likely to affect aggregate saving.

Attanasio uses the Consumer Expenditure Survey to analyze U.S. personal saving at the household level during the 1980s. This dataset is unique because it contains exhaustive information on both consumption and income at the micro level. He finds that the age profile of saving is roughly consistent with the predictions of the life-cycle model, at least until retirement age. However, other features of the data (such as the very low level of average and median interest income) seem to contradict the life-cycle model. Finally, the saving-age profiles of the middle cohorts, individuals born between 1929 and 1940, seem to be lower than those of the other cohorts.

Kitamura and Takayama note that in Japan, a high proportion of household savings are held by the elderly. But this fact alone cannot tell how the elderly accumulated their wealth. The authors conclude that young households obtain their wealth partly through their own finance (via loans) and partly through gifts and bequests from their parents. As they get older, their wealth is accumulated mainly through capital gains. After the age of 60, these households in turn start leaving bequests to their children.

Banks and Blundell find that savings behavior in the United Kingdom has varied across different cohorts. That is, 40-year-olds in 1980 exhibit different patterns of saving from 40-year-olds in 1990. Indeed, the prevailing view of wealth accumulation, based on cross-sectional "snapshots" at a point in time, suggests that wealth rises with age until retirement, and then gradually declines. However, the authors show that accounting for cohort differences paints a different picture of wealth accumulation over time. For example, they find a strong decline in consumption at retirement that appears to track the fall in labor income at retirement. These findings are important for understanding life-cycle models of consumption "smoothing" when income varies over time.

Börsch-Supan describes the composition of household saving in Germany and the factors that influence it. Germany has a very high household saving rate, about 14 percent, and gross wealth is dominated by housing

(52 percent). Financial assets are mainly in the form of passbook savings and life insurance, although among the younger households, a third important asset choice is the German "building society savings." Saving rates among Germans peak at old age after a small decline in the first five to ten years after retirement, Börsch-Supan finds.

The Italian personal saving rate is among the highest in the world. **Jappelli** and **Pagano** use microeconomic data and report how age affects Italian income, consumption, and wealth. Data on the timing and financing of home acquisition suggest that saving for housing purchases may be an important factor in asset accumulation. Jappelli and Pagano examine whether private health expenditures could be an important motive for saving. They also analyze the potential impact of social security on private wealth accumulation by estimating how social security benefits at retirement might offset labor income.

Selected papers presented at the conference and their discussion will be collected in an NBER conference volume to be published by the University of Chicago Press. Its availability will be announced in a future issue of the *NBER Reporter*.

Conference on Economic Growth

The NBER's seventh biannual conference on economic growth was held in Cambridge on April 16 and 17. NBER Research Associates Robert J. Barro, Harvard University, and Paul K. Romer, University of California, Berkeley, organized this program:

Alex Cukierman, University of Tel Aviv; **Pantelis Kalaitzidakis**, Columbia University; **Lawrence H. Summers**, U.S. Department of the Treasury; and **Steven Webb**, World Bank, "Central Bank Independence, Growth, Investment, and Real Rates"

Discussant: **Alberto F. Alesina**, NBER and Harvard University

Philippe Aghion, Oxford University, and **Jean Tirole**, Toulouse University, "On the Management of Innovation"

Discussant: **Michael D. Whinston**, NBER and Harvard University

Dan Ben-David and **David H. Papell**, University of Houston, "The Great Wars, the Great Crash, and the Unit Root Hypothesis"

Discussant: **Ron Miller**, Princeton University

Frank R. Lichtenberg, NBER and Columbia University, "R and D Investment and International Productivity Differences" (NBER Working Paper No. 4161)

Discussant: **Sam Kortum**, Boston University

Surjit S. Bhalla, Goldman Sachs & Co., and **Indermit S. Gill**, State University of New York, Buffalo, "Social Expenditure Policies and Welfare Achievement in Developing Countries" and "Externalities in New Growth Theory: The Importance of Female Human Capital"

Discussant: **T. Paul Schultz**, Yale University

Paul R. Krugman, NBER and MIT, "A Dynamic Spatial Model" (NBER Working Paper No. 4219)

Discussant: **Michael Woodford**, NBER and University of Chicago

Jess Benhabib, New York University, and **Roger Farmer**, University of California, Los Angeles, "Indeterminacy and Increasing Returns"

Michele Boldrin, Northwestern University, and **Aldo Rustichini**, New York University, "Growth and Indeterminacy in Dynamic Models with Externalities"

Danyang Xie, University of Montreal, "Divergence in Economic Performance: Transitional Dynamics with Multiple Equilibria"

Christophe Chamley, Boston University, "Externalities and Dynamics in Models of Learning or Doing"

Discussant: **Paul M. Romer**

Cukierman, **Kalaitzidakis**, **Summers**, and **Webb** investigate the effect of central bank independence (CBI) on growth, private investment, and productivity in 70 countries. They use an aggregate index of legal independence based on 16 specific features of the central banks' charters, and the average turnover rate of central bank governors, as proxies for CBI. They also consider the political vulnerability of the central bank in terms of replacement of the governor after a political transition. They find that CBI increases growth in developing countries, but has no effect within industrial countries.

Aghion and **Tirole** find that research is more likely to be conducted in an integrated structure if capital inputs are substantial relative to intellectual inputs. In contrast, when intellectual inputs dominate, as for software and biotechnology, research often will be performed by independent units. Further, when there are multiple innovations and/or multiple customers, property rights must be split on the basis of comparative advantage in creating value. Finally, cofinancing of an independent research unit by venture capitalists or banks may benefit the customer of the innovation.

Ben-David and **Papell**, using annual data spanning up to 130 years, investigate the unit root hypothesis for both aggregate and per capita GDP for 16 OECD countries. In about two-thirds of the cases, they find evidence against unit roots. The finding of trend stationarity introduces the possibility of examining the long-run behavior

"Central bank independence increases growth in developing countries, but has no effect within industrial countries."

of growth rates in the presence of significant breaks, mostly caused by wars. They find that, on average, post-break growth rates are over two times the prebreak rates.

Lichtenberg finds that privately funded investment in R and D has a significant positive effect on productivity.

“Government-funded research capital is less productive than private research capital.”

Moreover, this effect appears to be quite large. The estimated national rate of return to private investment in R and D is about seven times as large as the return to investment in equipment and structures. There are neither complete nor instantaneous spillovers of R and D internationally, though. Finally, **Lichtenberg** finds that government-funded research capital is less productive than private research capital.

Bhalla and Gill study ways of raising standards of health and schooling, as measured by infant mortality and secondary school enrollment rates, in 68 countries during 1960–87. They find only a weak direct link between government spending and improvements in health and education levels. On the other hand, they find that growth of private income is positively associated with improvements in both education and, especially, health. Still, the effectiveness of government spending and growth of private income is dwarfed by the gains from increased levels of female education. The largest gains in child health are achieved by increasing female education at the primary and secondary levels. Increases in school enrollment can be obtained best by eradicating female illiteracy, they find.

Bhalla and Gill also find that initial female education is positively correlated, but initial male education is negatively correlated, with growth of income or of total factor productivity for the same 68 countries during 1960–87. Nonmarket productivity of educated women is reflected in better health and schooling of their children, which in turn increases their income, it appears.

Any interesting model of economic geography must involve a tension between “centripetal” forces that tend to produce agglomerations and “centrifugal” forces that tend to pull them apart. **Krugman** explores one such model, and shows that it links a number of themes in the geography literature, including: the role of market access, as measured by “market potential,” in determining manufacturing location; the role of forward and backward linkages in producing agglomerations; the potential for “catastrophes” (that is, discontinuous changes in location in response to small changes in exogenous variables); and the idea that the economy is a “self-organizing system” that evolves into a self-sustaining locational structure.

Ben-Habib and Farmer analyze the implications of increasing returns, created by monopolistic competition or externalities, for the dynamics of growth and business fluctuations. They show that, with increasing returns to scale of plausible size, economic variables alone may

not be able to determine the equilibrium of the economy: there may be many possible paths that the economy can follow. The path taken may depend on whether expectations are optimistic or pessimistic, and therefore may be influenced by government policies.

Boldrin and Rustichini look at growth as caused by strong technological externalities induced by the aggregate stock of capital. In a one-sector model in which the technology effect prevents the marginal productivity of capital from decreasing to zero, they show that equilibrium is unique and there is a unique balanced growth rate. Further, the equilibrium growth rate decreases as the capital stock increases. In economies with two sectors of production, though, positive effect of technology will generate indeterminate equilibriums. This means that economies starting with the same capital stock may follow distinct growth experiences and become very different in the long run.

Xie uncovers several additional features of the Lucas (1988) growth model: there is a continuum of equilibriums if the external effect of human capital in the production of goods is sufficiently large.

Chamley measures the impact of endowment shocks on levels of output in the short and the long run. The dynamic patterns show that a negative correlation between output and growth does not mean that there is no endogenous growth. In general, endowment shocks can be followed by either higher or lower growth rates. Further, a sudden removal of taxation of capital income may lower welfare when there are externalities in human capital accumulation.

Economics of Aging

As part of its ongoing program of research on aging, directed by David A. Wise of Harvard University, there was an NBER conference on May 6 and 7. The following papers were discussed:

David N. Weil, NBER and Brown University, “Intergenerational Transfers, Aging, and Uncertainty”
Discussant: **James M. Poterba**, NBER and MIT

Michael D. Hurd, NBER and State University of New York, Stony Brook, “The Effect of Labor Market Rigidities on the Labor Force Behavior of Older Workers”

Discussant: **Angus S. Deaton**, NBER and Princeton University

Robin L. Lumsdaine, NBER and Princeton University; **James H. Stock**, NBER and Harvard University; and **David A. Wise**, “Why Are Retirement Rates So High at Age 65?”

John Ausink, U.S. Air Force Academy, and **David A. Wise**, "The Military Pension, Compensation, and Retirement of U.S. Air Force Pilots"

Discussant: **Robert Willis**, University of Chicago

Jonathan Gruber, NBER and MIT, and **Brigitte C. Madrian**, MIT, "Health Insurance and Early Retirement: Evidence from the Availability of Continuation Coverage"

Discussant: **Richard J. Zeckhauser**, NBER and Harvard University

Mark B. McClellan, NBER and MIT, "Why do Medicare Costs Keep Rising? Hospital Reimbursement and the Dynamics of Medical Treatment Intensity"

Discussant: **Thomas E. MaCurdy**, NBER and Stanford University

Axel H. Börsch-Supan, NBER and University of Mannheim; **Daniel L. McFadden**, NBER and University of California, Berkeley; and **Reinhold Schnabel**, University of Mannheim, "Living Arrangements: Health and Wealth Effects" (NBER Working Paper No. 4398)

Discussant: **Steven F. Venti**, NBER and Dartmouth College

Jonathan Feinstein, NBER and Yale University, "Elderly Health and Mobility"

Discussant: **Daniel L. McFadden**

Leslie E. Papke, NBER and Michigan State University; **Mitchell Petersen**, University of Chicago; and **James M. Poterba**, "Did 401(k) Plans Replace Other Employer-Provided Pensions?"

Discussant: **Richard H. Thaler**, NBER and Cornell University

Jonathan S. Skinner, NBER and University of Virginia, "Is Housing Wealth a Side Show?"

Discussant: **John B. Shoven**, NBER and Stanford University

Weil examines the effects of uncertainty—about when someone will die, for example—on the behavior of those who expect to receive bequests. Potential heirs who are prudent will consume less than would be warranted by the size of their expected bequests, and on average their consumption will rise when they actually receive the bequests. Aging of the population, by changing the relative sizes of the generation that leaves bequests and the one that receives them, will raise the average size of the bequests and reduce the heirs' saving. **Weil** shows that accounting for the effects of uncertainty slows down the reduction in saving that results from the aging of the population, though.

Hurd notes that most older workers retire completely from full-time work without an intervening spell of part-time work. This behavior is incompatible with tastes for work gradually shifting with age toward leisure, and with the ability to choose hours freely. **Hurd** surveys institutional arrangements, such as pensions and Social Se-

curity, and normal business practices that result from the fixed costs of employment and team production. He concludes that most workers must choose between a high-paying year-round job and low-paying part-time work. Faced with this choice, most older workers retire completely.

Lumsdaine, **Stock**, and **Wise** show that there is a spike in U.S. retirement rates at age 65: fewer than 30 percent of those working on their 64th birthday retire during the next year, but 40 percent or more of employed 65-year-olds retire at that age. Full Social Security benefits start at age 65; many defined-benefit pension plans treat 65 as the normal retirement age; and retirees become eligible for Medicare at age 65. Yet these economic incentives fail to explain the magnitude of the spike at age 65. Instead, they suggest that the spike is the result of custom, or rule-of-thumb behavior. This makes it substantially more complicated to simulate the effect of policy changes, such as increasing the full-benefit age for Social Security.

Ausink and **Wise** consider the relationship between the military's pension plan and retirement from the U.S. Air Force. They find that changes in the plan's provisions would have dramatic effects on retention of personnel.

State and federal "continuation of coverage" mandates grant a retiree the right to continue purchasing health insurance through a previous employer for a specified number of months after leaving the firm. **Gruber** and **Madrian** examine data on 55- to 64-year-old males from the Current Population Survey and the Survey of Income and Program Participation, and find that one year of continuation coverage raises retirement rates by over 15 percent. Furthermore, the effect appears to be uniform at all ages, rather than larger near the age of Medicare eligibility.

McClellan reexamines the incentives facing hospitals to use intensive technologies. He develops a model of hospital treatment for a health problem with the following features: 1) multiple intensity levels of treatment are possible; 2) patients prefer higher-quality care; 3) hospital and physician preferences for intensity may not coincide; 4) physicians retain residual control of the use of intensive hospital technologies; and 5) different choices of intensity may lead to different hospital payments. **McClellan** then examines the effects of Medicare's current reimbursement rules, and considers optimal pricing rules. He finds that the growth in hospital costs under the Medicare Prospective Payment System (PPS) may be largely attributable to reimbursement rules, rather than to exogenous technological change.

"The growth in hospital costs under the Medicare Prospective Payment System (PPS) may be largely attributable to reimbursement rules, rather than to exogenous technological change."

Börsch-Supan, McFadden, and Schnabel investigate the choice of living arrangements among elderly Americans. Because health cannot be measured directly and can be described only by certain indicators, they explore a new approach to modeling the influence of the latent health status on living arrangements. Then they use the NBER Economic Supplement of the Longitudinal Study on Aging to investigate the role of housing and financial wealth in the choice of living arrangements. They find that health is the most important determinant of living arrangements. Current income is of little relevance once wealth is accounted for. Both housing wealth and financial wealth increase the probability of living alone or with children, and reduce the likelihood of entering an institution.

Feinstein examines decisions by the elderly on whether to move when their health changes. He finds that, overall, the elderly will move frequently, even when mobility costs are large. These results also highlight the importance of transitional housing.

Papke, Petersen, and Poterba analyze a new survey of firms that provide 401(k) plans for their employees and find that these plans did not replace preexisting defined-benefit pension plans, although they did replace defined-contribution thrift and profit-sharing plans at some firms. Further, there is very little variation in participation from one year to the next at a given firm. This suggests that 401(k) participants do not make marginal decisions about contributing to the plan in a given month, or even year, but rather make long-term commitments to participate.

Since housing wealth comprises a large fraction of the net worth of retired households, **Skinner** asks whether recent projections of housing price declines spell trouble for the aging baby boom generation. The answer depends on whether households spend down housing equity. Skinner finds that retired households treat housing equity as a form of insurance or precautionary saving. They are unlikely to tap into equity, but when they do, it is because of adverse events, such as widowhood or downturns in income.

These papers and their discussions will be published by the University of Chicago Press in an NBER Conference Volume. Its availability will be announced in a future issue of the *NBER Reporter*.

Cooperation, Coordination, and Collusion Among Firms

The most recent NBER–Universities Research Conference, “Cooperation, Coordination, and Collusion Among Firms,” was organized by Severin Borenstein, University of California, Davis, and Andrea Shepard, Stanford Uni-

versity, and financed by the National Science Foundation. The May 14–15 agenda was:

Barbara Alexander, Brandeis University, “The Impact of the National Industrial Recovery Act on Cartel Formation and Maintenance Costs”

Discussant: **Michael Salinger**, Boston University

Robert H. Gertner, University of Chicago, “The Role of Firm Asymmetries for Tacit Collusion in Markets with Immediate Competitive Responses”

Discussant: **James Dana**, Dartmouth College

Andrew R. Dick, University of California, Los Angeles, “Information, Enforcement Costs, and Cartel Stability: An Empirical Investigation”

Discussant: **Steven Wiggins**, Texas A&M

George L. Mullin, Sidley and Austin; **Joseph C. Mullin**, University of Chicago Law School; and **Wallace P. Mullin**, Michigan State University, “The Dominant Firm Hypothesis, the ‘Puppy Dog Ploy,’ and the Competitive Effects of Mergers: Stock Market Evidence from the U.S. Steel Dissolution Suit”

Discussant: **Robin Prager**, Vanderbilt University

William M. Gentry, NBER and Duke University, “Franchising and the Dilution of Ownership of Intangible Assets”

Discussant: **Francine LaFontaine**, University of Michigan

Joseph Farrell, University of California, Berkeley, “Choosing the Rules for Formal Standardization”

Discussant: **Glenn Ellison**, Harvard University

Charles F. Mason, University of Wyoming, and **Stephen Polasky**, Boston College, “Nonrenewable Resource Cartels: Who’s in the Club?”

Discussant: **Preston McAfee**, University of Texas

Kenneth Hendricks, University of British Columbia, and **Robert H. Porter**, NBER and Northwestern University, “A Model of Joint Bidding and Entry with Application to Offshore Federal Oil and Gas Lease Auctions”

Discussant: **Steven T. Berry**, NBER and Yale University

At some level, the costs of forming and maintaining a cartel are outweighed by the spoils of collusion. **Alexander** applies a “switching of regimes” technique to data from the Census of Manufacturers and finds a “critical concentration level” of 60 percent in 1933, which disappears in 1935, and reemerges at 38 percent in 1937. Her results suggest that even temporary shifts in anti-trust regimes may have lasting impacts on the ability of an industry to exercise market power.

Gertner develops a model in which two firms choose price sequentially and alternate moves. At each decision point, a firm can reduce its price or say “okay.” If the two firms say “okay” consecutively, then consumers’ buying decisions are based on the most recent prices chosen.

There are no purchases or discounting while firms are changing price, thereby completely eliminating single-period gains from price cutting. Gertner shows that applying this model to price competition with constraints on symmetric capacity yields collusive pricing. If any firm cuts price, its rival will match, thereby eliminating incentives to cut price. If two firms differ significantly, or in certain settings, collusion may not be complete. This may help to explain price wars and other pricing behavior in the airline industry.

Dick analyzes a unique dataset of industry cartel agreements that are legal and not enforced by government. He finds that previous analyses tended to overstate the average lifespan of a cartel and the frequency and stability of repeated collusion. By ignoring differences in cartel objectives, previous analyses also obscured the link between internal cartel organization and stability. Further, cartel duration varies significantly and in the predicted direction with price variability, buyer turnover, industry coverage, business cycle timing, and the existence of parallel agreements among rivals. There is also some evidence that cartel stability declines with both tenure and repeat experience.

Mullin, Mullin, and Mullin use the unsuccessful suit to break up U.S. Steel to examine the competitive effects of mergers, the sources of market power, and appropriate antitrust policy. In particular, using weekly data from 1910–20, they examine the stock market reactions of U.S. Steel, its major steel industry rivals, downstream customers, and upstream suppliers, to events from the dissolution suit. The pattern of stock market reactions supports the efficacy of U.S. Steel's accommodative business strategy, implies that its dissolution would have lowered steel prices, and is consistent with the view that the steel industry's market power was bolstered by U.S. Steel's vertical relationships with iron ore suppliers. The results also suggest that an aggressive merger policy could have lowered steel prices and increased output.

Gentry compares the choices of financial structures of three types of publicly held restaurant firms: 1) those with some franchising; 2) those that do not franchise; and 3) those that are franchisees of other firms. The data suggest that chains that do not franchise borrow less, and pay dividends more frequently, than franchisors. Franchising is an integral part of the choice of capital structure within the restaurant industry.

Formal standardization—explicit agreement on compatibility standards—has important advantages over the bandwagon, or *de facto*, method of reaching standardization, but it is marred by severe delays. **Farrell** explores the trade-offs between speed and the quality of the outcome in a model in which it is difficult to determine which technology is best. He shows that the consensus process is excessively slow. He discusses strategies to reduce delay, including changes in intellectual

property policy and voting rules, beginning standardization efforts early, and using options. For instance, reducing vested interest by compulsory licensing policies can reduce delays so much that the incentives for participation and for product improvement actually are increased, not reduced as might naturally be feared.

Mason and Polasky analyze cartel membership among heterogeneous producers in the context of a market for a nonrenewable resource, such as oil. They show that the ability to support collusion in equilibrium is related to the amount of reserves of the resource. Producers with large reserves should be more likely to join a cartel than producers with small reserves. Also, low production costs make inclusion in the cartel more likely. Using yearly oil market data from 1970 to 1991, Mason and Polasky find that having larger reserves and lower costs are associated positively with OPEC membership. Several members of OPEC are not natural candidates for inclusion in the cartel (Ecuador and Gabon in particular), while only one non-OPEC member (Mexico) is a strong candidate for inclusion.

Hendricks and Porter note that the firms that participated frequently in the sale of federal oil and gas leases on the Outer Continental Shelf usually did not bid jointly with each other, even though it was not illegal to do so. This is surprising, since the potential gains from joint bidding—information sharing, risk pooling, and reduced competition—appear significant, and the costs are not obvious. The authors develop a model in which firms have to invest in information if they intend to bid on their own, and this investment decision is private. The equilibrium yields a number of useful predictions on entry rates, the likelihood and profitability of joint bids, and how the distributions of these random variables vary with tract characteristics that appear to be consistent with the data.

The Political Economy of Regulation

The NBER hosted a conference on "The Political Economy of Regulation: An Historical Analysis of Government and the Economy" in Cambridge on May 20 and 21. The following program was organized by Claudia Goldin, director of the NBER's Program on the Development of the American Economy, also of Harvard University, and Gary D. Libecap, NBER and the University of Arizona:

Mark T. Kanazawa, Carleton College, and **Roger G. Noll**, Stanford University, "The Origins of State Railroad Regulation: The Illinois Constitution of 1870"

Discussant: **Thomas Gilligan**, University of Southern California

Shawn E. Kantor and **Price V. Fishback**, NBER and University of Arizona, "Coalition Formation and the Adoption of Workers' Compensation: The Case of Missouri, 1911–26"

Discussant: **Edward L. Glaeser**, NBER and Harvard University

John J. Wallis, NBER and University of Maryland; **Richard E. Sylla**, NBER and New York University; and **John B. Legler**, NBER and University of Georgia, "Taxation and Regulation in Nineteenth-Century America: With Particular Attention to Banks"

Discussant: **Naomi Lamoreaux**, NBER and Brown University

Elizabeth Hoffman, University of Arizona, and **Gary D. Libecap**, "Political Bargaining and Cartelization Under New Deal Agricultural Policies: Citrus Marketing Orders in the 1930s"

Discussant: **Alberto F. Alesina**, NBER and Harvard University

Keith T. Poole and **Howard Rosenthal**, Carnegie–Mellon University, "Congress and Railroad Regulation"

Discussant: **Lance Davis**, NBER and California Institute of Technology

Claudia Goldin, "The Political Economy of Immigration Restriction in the United States, 1890–1921" (NBER Working Paper No. 4345)

Discussant: **Joseph P. Ferrie**, NBER and Northwestern University

Alan G. Green, NBER and Queen's University, "The Political Economy of Immigrant Selection in Canada, 1896 to 1930"

Discussant: **Jeffrey G. Williamson**, NBER and Harvard University

Charles W. Calomiris, NBER and University of Illinois, and **Eugene N. White**, NBER and Rutgers University, "The Origins Of Federal Deposit Insurance"

Discussant: **Geoffrey Miller**, University of Chicago

Werner Troesken, University of Pittsburgh, "The Institutional Antecedents of State Utility Regulation: The Chicago Gas Industry, 1860–1913"

Discussant: **John Panzar**, Northwestern University

In 1870, Illinois ratified a new state constitution setting forth a legal framework for regulation of railroads. **Kanazawa** and **Noll** find that most Illinois convention delegates and voters thought that railroad regulation would reduce prices, but not by enough to curtail investment in the railroad. However, some of the voters and delegates voted as if they believed that regulation *would* expropriate railroad capital and halt expansion of the rails.

Kantor and **Fishback** use the adoption of workers' compensation in Missouri to examine the process by which coalitions are formed to pass regulatory legislation. The Missouri case shows that it is a mistake to treat all workers' compensation legislation, or any other broad class of regulation, as uniform. The design of each state's workers' compensation law, which in turn influences the attitudes of various groups toward the legislation, determines how a winning coalition is formed.

Wallis, **Sylla**, and **Legler** examine the relationship between the taxation and regulation of banks in the early nineteenth century. They find that states that taxed bank capital had an incentive to increase the amount of bank capital and, therefore, to encourage entry into the banking industry. States that owned stock in banks or earned substantial amounts from the sale of bank charters, in contrast, had an incentive to maximize the profits of existing banks, and therefore to limit entry.

Hoffman and **Libecap** show why even government-sponsored cartelization was unable to reach parity-price goals for agricultural commodities in the 1930s. The production and marketing controls put into place by the Agricultural Adjustment Act (AAA) failed to reduce market supply substantially. As a result, policy shifted to other means of raising farm incomes that remain today: transfer payments, credit subsidies, and price-support programs that emphasized government purchases of "excess supplies," rather than cartelization. Hoffman and Libecap specifically analyze negotiations between the AAA and the California and Florida orange industries to determine why the marketing agreements put into place in the two states differed in significant ways, and why these negotiations did not lead to nationwide prorationing of orange shipments as authorized by law.

At the end of the nineteenth century, the Democrats in Congress generally supported, and the Republicans opposed, bimetallism, regulation of the railroads, and regulation of trusts. Big-city Democrats and farm belt Republicans defected from others in their party, though. **Poole** and **Rosenthal** study railroad regulation to show why these long-lasting coalitions over a broad range of issues are likely to be more relevant than contemporaneous interests on specific economic provisions of legislation. They contrast the stability of coalitions on economic issues with their potential fragility when exposed to race, which opens an alternative line of conflict.

Goldin explores the economic and political forces that kept the United States open to immigrants for the early years of the twentieth century, and the factors that eventually closed it. Much of the rural heartland of America was prorestriction from the 1890s on; the South as a block shifted from an antirestriction position in the 1890s to a prorestriction position in the early 1900s. The real battle, though, was waged in American cities where economic downturns and their consequent unemployment almost always brought demands for restriction.

The flood of immigrants eventually did produce substantial negative effects on the wages of native-born workers. But the political clout of immigrants was strengthened by the reinforcing nature of their flows. Cities with large numbers of foreign born received a disproportionate share of immigrants from 1900 to 1910. After 1910, however, immigrant flows were diluting, and the negative impact of immigrants on the wages of many native-born workers led to the passage of restrictionist legislation.

Beginning with the Immigration Act of 1910 and, through a series of orders-in-council evolving over the next half century, a flexible and rational immigration policy emerged in Canada. **Green** argues that the orders-in-council, which did not require the government to seek parliamentary approval to change the direction of immigration policy, were extremely important in shaping the level and composition of immigrant inflow. The joint concerns of the landed and capital (railway) interests shaped policy up to 1930, encouraging the inflow of foreign workers who were willing to settle on Canadian farms. In addition, regulations and special agreements with shipping agents were introduced to limit the inflow to Canada of groups largely excluded from the United States under the quota system established in 1921. Canadian immigration policy until the early 1960s was discriminatory, dividing the world between preferred and nonpreferred countries.

Calomiris and **White** explain that, until the 1930s, federal deposit insurance was perceived as a subsidy for high-risk unit banks. Its success in 1933 did not reflect increased power of special interests, but rather the entrepreneurship of Representative Steagall, who moved the debate to the public forum. His efforts were aided by the unpopularity of the perceived alternative for stabilizing banks: branch banking. There was a public perception at the time that large banks had caused the Great Depression.

Focusing on the manufactured coal gas industry in late nineteenth- and early twentieth-century Chicago, **Troesken** examines the origins of regulation of state utilities. He links the demise of unfettered competition to the technological and legal changes that preceded the onset of state regulation. He also suggests that, because producers were locked into specific geographic markets by sizable and immobile investments, political regulation of rates was confiscatory when overly responsive to consumers' demands for low prices. Finally, Chicago's experience can help to explain why utilities favored state over municipal regulation. Because consumers monitored local regulators better than state regulators, municipal authorities faced stronger electoral incentives to bring consumers low rates.

A conference volume will be published by the University of Chicago Press. Its availability will be announced in a future issue of the *NBER Reporter*.

Bureau News

New Directors Elected

The NBER's Board of Directors elected three new at-large members at its April meeting: **Elizabeth E. Bailey**, **Michael H. Moskow**, and **Marina v. N. Whitman**.

Bailey is currently the John C. Hower Professor of Public Policy and Management at the Wharton School, University of Pennsylvania. From 1983–90, she was dean and professor of economics at Carnegie–Mellon University's Graduate School of Industrial Administration. Previously, from 1977–83, she served as a commissioner of the Civil Aeronautics Board. An expert on airline deregulation, Bailey holds a B.A. in economics from Radcliffe College, an M.S. in mathematics and computer science from Stevens Institute, and a Ph.D. in economics from Princeton University.



Moskow is currently a Visiting Scholar at the Kellogg Graduate School of Management of Northwestern University. He served as Deputy U.S. Trade Representative with the rank of ambassador from 1991 to 1993. Prior to that, he held leadership roles in private industry for 14 years. From 1969–77, he held various positions in Washington, including Under Secretary of Labor, Director of the Council on



Wage and Price Stability, and Assistant Secretary for Policy Development and Research at the Department of Housing and Urban Development. Moskow taught economics, labor relations, and management at Temple University, Lafayette College, and Drexel University. He holds an A.B. in economics from Lafayette College, and an M.A. and Ph.D. from the University of Pennsylvania.

Whitman is a Distinguished Visiting Professor of Business Administration and Public Policy at the University of Michigan. From 1979–92, she was an officer of the

General Motors Corporation, serving first as vice president and chief economist, and later as vice president and group executive for public affairs. Prior to joining GM, from 1962–73, Whitman was a member of the economics faculty of the University of Pittsburgh. She was also a member of the President's Council of Economic Advisers in 1972–3 while on leave from the university. The author of



several books and articles in international economics, Whitman holds a B.A. in government from Radcliffe College and an M.A. and Ph.D. in economics from Columbia University.

AEA to Honor Anna Schwartz

At its January 1994 Annual Meeting, the American Economic Association will name Anna Schwartz a Distinguished Fellow of the association. Schwartz, an NBER research associate emeritus in monetary economics, has been affiliated with the Bureau since 1941. Dr. Schwartz has written many journal articles and books, but she is perhaps best known for her work with Milton Friedman on monetary economics.



A native of New York City, Dr. Schwartz received a B.A. from Barnard College and an M.A. and, in 1964, a Ph.D. from Columbia University. Before joining the Bureau staff, she did research for the U.S. Department of Agriculture and the Columbia University Social Science Research Council.

Dr. Schwartz was staff director of the U.S. Gold Commission in 1981–2, and president of the Western Economic Association in 1987–8. She is currently an adjunct professor at the Graduate School of the City University of New York, and an honorary visiting professor at the City University Business School, London.

Economic Historians Gather in Cambridge

Members and guests of the NBER's Program on the Development of the American Economy, directed by Claudia Goldin of Harvard University, met in Cambridge on March 6 to discuss this program:

T. Aldrich Finegan, Vanderbilt University, and **Robert A. Margo**, NBER and Vanderbilt University, "Added and Discouraged Workers in the Late 1930s: A Reexamination" (NBER Historical Paper No. 45)

Timothy F. Bresnahan, NBER and Stanford University, and **Daniel M. G. Raff**, NBER and Harvard University, "Technological Heterogeneity, Adjustments Costs, and the Dynamics of Plant Shutdown Behavior: The American Motor Vehicle Industry in the Time of the Great Depression"

John J. Wallis, NBER and University of Maryland, "Form and Function in the Public Sector: State and Local Government in the United States, 1902–1982"

Shawn E. Kantor, NBER and University of Arizona, and **Price V. Fishback**, University of Arizona, "Insurance Rating and the Origins of Workers' Compensation"

Kenneth L. Sokoloff, NBER and University of California, Los Angeles, "In Pursuit of Private Comfort: Early American Industrialization, 1790 to 1860"

Finegan and **Margo** use data on married women drawn from the 1940 Census to show that the "added-worker effect" was alive and well in the late 1930s, but it was muted by work relief. Wives whose husbands held "public emergency relief" jobs with the Works Progress Administration or related agencies were far less likely to participate in the labor force than other wives were. In fact, the added-worker effect disappears in the aggregate if the impact of worker relief is ignored.

Bresnahan and Raff study the U.S. automotive industry in 1929–35. They find that the incomplete diffusion of an important new technology, mass production, had a large impact on industry behavior during the Depression. Differences between mass production plants and those still relying to an important extent on older

“The spread of markets during early industrialization increases growth by stimulating greater specialization and inventive activity throughout the economy.”

methods explain most of the difference in their survival probabilities. Still, product differentiation provided the more traditional plants with substantial protection from competition. Further, the much lower flexibility in labor force adjustment of traditional plants left them with a recoverable fixed cost: the human capital of their highly skilled blue collar work forces.

Over the course of the twentieth century, the state and local sector has become significantly more centralized. **Wallis** finds that this growing centralization is explained by the growing volume and changing nature of federal government grants to state and local government. It is not explained by a shift in demand for government services toward more centralized activities, such as social welfare services.

Kantor and Fishback investigate the availability of private accident insurance prior to the adoption of mandatory workers' compensation insurance. Analyzing workers' behavior with respect to insuring and saving suggests that informational problems associated with insuring an individual's workplace accident risk led both insurance companies and workers to anticipate gains from the switch to workers' compensation. Rationing insurance near the turn of the century may have been one of the central economic motives for adopting workers' compensation legislation.

Sokoloff reviews two hypotheses about the nature and sources of early economic growth: The first argues that the spread of markets during early industrialization increases growth by stimulating greater specialization and inventive activity throughout the economy. There can be much progress during this phase of growth without major increases in capital intensity or in the type of equipment used. The alternative view contends that early economic growth typically is unbalanced, with a leading sector and dramatic breakthroughs embodied in physical capital leading the way. Sokoloff argues that the evidence on early American industrialization strongly favors the former perspective. Not only is rapid and rather balanced productivity growth in manufacturing evident before the widespread diffusion of mechanization in the 1840s and 1850s, but geographic and temporal patterns in patenting by both ordinary patentees and “great inventors,” as well as in firm-level productivity, suggest that invention and innovation were very responsive to the ex-

tension of markets. Only in the second half of the nineteenth century does technology embodied in physical capital seem to have played a dominant role. The U.S. experience helps us to understand how newly industrializing East Asian economies have been able to attain such high rates of technical change in recent decades, and has implications for policy in the rest of the developing world.

Productivity Researchers Meet

The NBER's Program in Productivity, directed by Zvi Griliches of Harvard University, met in Cambridge on March 14 and 15 to discuss the following papers:

Tor Jakob Klette, Central Statistical Bureau, Norway, “Is Price Equal to Marginal Cost? An Integrated Study of Price–Cost Margins and Scale Economies Among Norwegian Manufacturing Establishments, 1975–80”

Discussant: **Charles R. Hulten**, NBER and University of Maryland

Paul Geroski, London Business School; **Stephen Machin**, London School of Economics; and **John Van Reenan**, University College, London, “The Profitability of Innovating Firms”

Discussant: **Bronwyn H. Hall**, NBER and Stanford University

David H. Austin, University of California, Berkeley, “Estimating the Effects of Rival Patents in Biotechnology: An Event Study”

Discussant: **Jean O. Lanjouw**, NBER and Yale University

Ernst R. Berndt, NBER and MIT; **Zvi Griliches**; and **Neal Rappaport**, MIT, “Econometric Estimates of Price Indexes for Personal Computers in the 1980s and 1990s”

Ariel Pakes and **Steven T. Berry**, NBER and Yale University, and **James A. Levinsohn**, NBER and University of Michigan, “Applications and Limitations of Some Recent Advances in Empirical Industrial Organization: Price Indexes and the Analysis of Environmental Change”

Using a comprehensive dataset of individual establishments in the Norwegian manufacturing sector during 1975–90, **Klette** finds that the deviations between price and marginal cost generally are very small. For most in-

dustries, the price-cost margin is not significantly different from one: the ratio of price to marginal cost is typically less than 1.1. Also, for most sectors, there are moderate decreasing returns at the margin.

Geroski, Machin, and Van Reenan find that the number of innovations produced by a firm has a positive effect on its profitability. Also, there are relatively small spillovers associated with these innovations, compared to the much larger spillovers estimated for U.S. expenditures on R and D. Innovators seem to enjoy higher profit margins because of the specific innovations they introduce, but there are also substantial permanent differences in firms' profitability that are not timed closely with the introduction of specific innovations. These differences probably reflect generic differences in "competitive ability," and seem to be associated only generally with the process of innovating. Innovating firms have larger market shares than noninnovators do, and the profit margins associated with a given market share are higher for innovating firms. Finally, the profit margins of innovating firms are somewhat less sensitive to cyclical downturns than those of noninnovators are.

Austin shows that a broad array of patent grants can significantly boost firm value. For the biotechnology firm of median size in his sample, even patents not linked to any product will boost firm value by more than \$1.5 million, while linked patents boost firm value by \$2 million. The few patents announced in the *Wall Street Journal* are evidently significant enough that their firms' values climbed \$11 million on average in the first two days after they were issued. There seems little doubt that the market values patents in biotechnology.

Berndt, Griliches, and Rappaport construct a number of quality-adjusted price indexes for personal computers in the United States during 1989-92. The simple arithmetic mean of prices of models by year reveals a price decline of about 1 percent per year. But a matched-model procedure, similar to that commonly used by government statistical agencies, generates a much larger rate of price decline: about 10 percent per year. The matched-model procedure ignores quality change embodied in new models, though. When data on new and surviving models are used, these quality-adjusted price indexes decline on average at about 20 percent per year.

Pakes, Berry, and Levinsohn explain how recently developed empirical models of markets for differentiated products can improve price indexes. They show how price indexes for automobiles change when they account for changes in product characteristics. The authors also show that the automobile industry apparently responded to changes in environmental standards by increasing R and D and by changing product characteristics.

Spring Meeting of Asset Pricing Program

Members of the NBER's Program in Asset Pricing, directed by John Y. Campbell of Princeton University, met in Cambridge on March 19 to discuss the following papers:

David S. Bates, NBER and University of Pennsylvania, "Jumps and Stochastic Volatility: Exchange Rate Processes Implicit in PHLX Foreign Currency Options"

Discussant: **Jeremy C. Stein**, NBER and MIT

Jennifer Conrad and **Allaudeen Hameed**, University of North Carolina, Chapel Hill, and **Cathy M. Ninden**, University of Notre Dame, "Volume and Autocovariances in Short-Horizon Individual Security Returns"

Discussant: **Bruce N. Lehmann**, NBER and University of California, San Diego

Larry G. Epstein, University of Toronto, and **Angelo Melino**, NBER and University of Toronto, "A Revealed Preference Analysis of Asset Pricing Under Recursive Utility"

Discussant: **Philippe Weil**, NBER and European Center for Advanced Research in Economics

Ravi Bansal, **David A. Hsieh**, and **S. Viswanathan**, Duke University, "A New Approach to International Arbitrage Pricing"

Discussant: **René M. Stulz**, NBER and Ohio State University

David K. Backus, NBER and New York University, and **Stanley E. Zin**, NBER and Carnegie-Mellon University, "Long-Memory Inflation Uncertainty: Evidence from the Term Structure of Interest Rates" (NBER Technical Working Paper No. 133)

Discussant: **Frank Diebold**, University of Pennsylvania

Louis K. C. Chan and **Josef Lakonishok**, University of Illinois, "Are the Reports of Beta's Death Premature?"

S. P. Kothari and **Jay Shanken**, University of Rochester, and **Richard G. Sloan**, University of Pennsylvania, "Another Look at the Cross-Section of Expected Stock Returns"

Bates uses the prices of an array of foreign currency options traded on the Philadelphia Stock Exchange to study the distribution of Deutschmark-dollar exchange rate movements that market participants expected in 1984-91. He allows for exchange rate volatility that changes randomly and for discrete jumps in exchange rates. He finds that random volatility is important in explaining the pattern of options prices, while jumps are much less important. There is a puzzling discrepancy between the volatility behavior implied by the cross-section

tional pattern of options prices and the volatility behavior implied by the time-series movements of options prices.

There has been much recent interest in contrarian investment strategies, or buying assets that have performed poorly in the recent past and selling assets that have performed well. **Conrad, Hameed, and Niden** show that information on trading volume can be used to enhance the performance of contrarian strategies. Stocks that have moved on high volume tend to experience price reversals in subsequent weeks, while stocks that have moved on low volume may continue to move in the same direction. Those results are particularly strong for smaller stocks.

Epstein and Melino review intertemporal models of investors' attitudes toward risk. They argue that it is desirable to study risk preferences without imposing restrictive functional forms, and they develop a nonparametric or revealed preference approach to the problem.

Bansal, Hsieh, and Viswanathan develop a nonlinear arbitrage pricing model in which a large number of assets can be priced using a few common factors. This allows the model to handle assets like options whose payoffs are related in a nonlinear way to the payoffs of other assets. In a first empirical application, the model adequately explains the pattern of returns on international equities, bonds, and forward currency contracts.

Backus and Zin compare the variability of short- and long-term interest rates. They argue that a "long-memory" model of the short rate, in which disturbances die out very slowly, helps to account for the relatively high variability of postwar U.S. long bond yields.

In a special session, two groups of economists reviewed the intense debate on the empirical performance

"Stocks that have moved on high volume tend to experience price reversals in subsequent weeks, while stocks that have moved on low volume may continue to move in the same direction."

of the Capital Asset Pricing Model (CAPM). **Chan and Lakonishok** point out that noise in stock returns makes it extremely hard to judge the model, even given many years of data. They also argue that the model may have performed poorly during the 1980s because increased

demand for index products has driven up the prices of stocks included in the Standard & Poor's 500 Index. Many such stocks have low betas, so the effect of indexed products causes them to have temporarily higher returns than the CAPM predicts.

Kothari, Shanken, and Sloan concentrate on recent claims that the ratio of book value to the market value of equity is a useful predictor of average returns. They argue that this is only valid after 1962 and when firms are selected from the COMPUSTAT database. Using COMPUSTAT data also may lead to survivorship bias because firms that do poorly disappear from the database.

Labor Studies Group Convenes

Members and guests of the NBER's labor studies program met in Cambridge on March 25 and 26. Program Director Richard B. Freeman, Harvard University, organized this program:

David Card, NBER and Princeton University, and **Thomas Lemieux**, NBER and University of Montreal, "Wage Dispersion, Returns to Skill, and Black-White Wage Differentials" (NBER Working Paper No. 4365)

Guido W. Imbens, NBER and Harvard University, and **Lisa M. Lynch**, NBER and MIT, "Labor Market Transitions Over the Business Cycle"

Ronald G. Ehrenberg, NBER and Cornell University, and **Dominic Brewer**, Cornell University, "Did Teachers' Race and Verbal Ability Matter in the 1960s? *Coleman Revisited*" (NBER Working Paper No. 4293)

John M. Abowd, NBER and Cornell University; **Francis Kramarz**, Institut National de la Statistique et des Etudes Economiques; and **David Margolis**, Cornell University, "High-Wage Workers and High-Wage Firms: Compensation Policies and Firms' Performance in France"

Daniel S. Hamermesh, NBER and Michigan State University, and **Jeffrey E. Biddle**, Michigan State University, "Beauty in the Labor Market"

Francine D. Blau, NBER and University of Illinois, Urbana-Champaign, and **Lawrence M. Kahn**, University of Illinois, Urbana-Champaign, "The Impact of Wage Structure on Trends in U.S. Gender Wage Differentials: 1975-87"

Card and Lemieux note that, during the 1980s, wage differentials between younger and older workers, and between more- and less-educated workers, expanded rapidly. Wage dispersion among individuals of the same age and education also rose. They find that for white men and women between 1979 and 1989, earnings represent a return to a one-dimensional bundle of skill, and that the rate of return to skill rose over the decade.

Imbens and Lynch find that, while personal characteristics have some impact on the expected duration of spells out of work, demand factors appear to be much more important. Also, the longer a current spell of not working is, the more difficult it is for an individual to become reemployed. Finally, the authors find that while being in a local labor market with high unemployment reduces the probability of reemployment, individuals in such areas who have not worked in a long time are more likely to be reemployed than individuals who live in low unemployment areas who have not worked in a long time.

Ehrenberg and **Brewer** reanalyze data from the classic 1966 study, *Equality of Educational Opportunity*, or the *Coleman Report*. They ask whether teacher characteristics, including race and verbal ability, influenced the "synthetic gain scores" (mean test scores of upper-grade students in a school minus mean test scores of lower-grade students in a school) at that time. They find that teachers' verbal aptitude scores did influence synthetic gain scores for both black and white students. Verbal aptitude mattered as much for black teachers as it did for white teachers. Further, black teachers were associated with higher gain scores for black high school students, but lower gain scores for white elementary and secondary students.

Analyzing a sample of over 14,000 firms and 800,000 workers from a unique French data source, **Abowd**, **Kramarz**, and **Margolis** find that both improving the quality of the work force and increasing the firm-specific wage have positive impacts on firm profitability. However, their effect on productivity is more complicated. Also, firms that employ higher-quality workers tend to survive longer, while those with more lucrative compensation policies "die" faster. Finally, the authors find that increasing the rewards to seniority has a positive impact on the lifetime of a firm.

Using the 1977 Quality of Employment Survey and the 1971 Quality of American Life Survey, which contain interviewers' ratings of the respondents' looks, **Hamer-mesh** and **Biddle** explore the relationship between beauty and economic outcomes. They find that more-educated people are better looking than their less-educated peers with the same family income. Holding a variety of demographic and labor market characteristics constant, plain people earn less than people of average looks, who earn less than the good looking. The authors also find that the penalty for plainness is larger than the premium for beauty. The effects are roughly the same for men and women. Better-looking people sort into occupations in which beauty is likely to be more productive, but sorting has only tiny effects on earnings differentials among workers with different looks.

Blau and **Kahn** use 1975 and 1987 data from the Michigan Panel Study on Income Dynamics and 1971 and 1988 data from the Current Population Survey to analyze the dramatic decrease in the male-female pay gap during the 1980s. They trace the decline to a rise in the relative experience levels of women, an upgrading of women's occupational status compared to men's, and to a larger impact of deunionization on male than on female workers. In addition, there was a substantial decline in the "unexplained" portion of the pay gap, particularly after adjusting for human capital variables. Also, demand shifts benefited women relative to men at lower levels of labor market skills, but favored men relative to women at higher levels. Blau and Kahn find that the pay gap between men and women closed faster at the bottom of the skill distribution than at the top.

Corporate Finance Program Meets

Rob Vishny of the University of Chicago, director of the NBER's corporate finance program, arranged the group's March 26 meeting in Cambridge. The program was:

Raghuram Rajan and **Henri Servaes**, University of Chicago, "The Effect of Market Conditions on Initial Public Offerings"

Discussant: **Jay Ritter**, University of Illinois, Urbana-Champaign

Michael S. Weisbach, University of Rochester, "The CEO and the Firm's Investment Decisions"

Discussant: **Robert Gertner**, University of Chicago

Stuart C. Gilson, Harvard University, "Capital Structure Rearrangements in Firms that Default: An Empirical Study"

Discussant: **Luigi Zingales**, University of Chicago

William L. Megginson and **Robert C. Nash**, University of Georgia, and **Matthias van Randenborgh**, University of Bielefeld, Germany, "The Financial and Operating Performance of Newly Privatized Firms: An International Empirical Analysis"

Discussant: **Andrei Shleifer**, NBER and Harvard University

Takeo Hoshi, University of California, San Diego;

Anil K. Kashyap, NBER and University of Chicago; and **David S. Scharfstein**, NBER and MIT,

"The Choice Between Public and Private Debt: An Analysis of Post-Deregulation Corporate Financing in Japan"

Discussant: **Gary B. Gorton**, NBER and University of Pennsylvania

Rajan and **Servaes** examine the effect of market conditions on initial public offerings (IPOs). They assume that two market conditions change over time: investor sentiment, which is insensitive to price; and feedback trader risk, or the propensity of investors to chase trends. The authors show that these conditions influence three elements of the IPO market: underpricing; hot issue markets; and long-term underperformance. Using a sample of IPOs from 1975 to 1987, they find that the predictions of the model are largely borne out in the data.

Weisbach examines the relationship between management changes and divestitures of recently acquired divisions. He finds that the probability of divesting an acquisition that is sold at a loss, or considered unprofitable by the press, increases around the time of a change in management. Divestiture probabilities increase by about the same amount following retirements at age 65 and other resignations. Overall, Weisbach finds that succes-

sions are important for corporations because they appear to lead to substantial reversals of poor prior decisions, and are consistent with a variety of agency-based theories of corporate investment.

Gilson analyzes adjustments to the capital structure of 111 publicly-traded firms that filed for Chapter 11 or privately restructured their debt during the 1980s. Although recontracting between firms and creditors typically was accompanied by a reduction in the face value of firms' debt, more than 80 percent of the sample firms emerged from bankruptcy or restructuring more highly

"After they are privatized, firms become more profitable, increase their capital investment spending, improve their operating efficiency (output per employee), and increase their work forces."

leveraged than the median firm in their industry. Few of these firms subsequently attempted to reduce their leverage by issuing new equity. Possibly as a result, one out of every four firms had to file for bankruptcy or restructure their debt more than once during the sample period.

Two explanations for firms' failure to "unlever" their capital structures appear to be resistance by institutional lenders to taking writedowns of their principal, and avoidance of the corporate tax on income generated by cancellation of indebtedness.

Meggison, Nash, and van Randenborgh compare the financial and operating performance of 61 companies from 18 countries and 32 industries before and after privatization achieved through public share offerings during 1961–90. They document strong improvements in performance, surprisingly achieved without sacrificing employment security. After they are privatized, firms become more profitable, increase their capital investment spending, improve their operating efficiency (output per employee), and increase their work forces. Furthermore, these companies significantly lower their debt levels and increase dividend payout. Finally, there are significant changes in the size and composition of corporate boards of directors after privatization.

Hoshi, Kashyap, and Scharfstein note that, as a result of deregulation, there was a dramatic shift during the 1980s in Japan away from bank debt financing and toward public debt financing. In 1975, more than 90 percent of the corporate debt of public companies was bank debt; in 1992, it was less than 50 percent. They find that companies with high net worth are more prone to use public debt. Also, the more successful members of industrial groups (or keiretsu) tend to access the public debt markets, while the less successful members tend to maintain their dependence on bank borrowing.

Researchers Discuss International Trade and Investment

On April 2 and 3, members and guests of the NBER's Program in International Trade and Investment, directed by Robert C. Feenstra, University of California, Davis, met to discuss these papers:

Kala Krishna, NBER and Tufts University, and **Ling Hui Tan**, Tufts University, "License Price Paths: Theory and Evidence from Hong Kong" (NBER Working Paper No. 4237)

Paul Livas Elizondo, MIT, and **Paul R. Krugman**, NBER and MIT, "Trade Policy and the Third World Metropolis" (NBER Working Paper No. 4238)

S. Lael Brainard, NBER and MIT, "A Simple Theory of Multinational Corporations and Trade with a Trade-Off Between Proximity and Concentration" (NBER Working Paper No. 4269)

Joshua Aizenman, NBER and Dartmouth College, "Foreign Direct Investment as a Commitment Mechanism in the Presence of Managed Trade" (NBER Working Paper No. 4102)

Jonathan Eaton, NBER and Boston University, and **Samuel Kortum**, Boston University, "International Technology Diffusion"

Krishna and Tan examine the prices of quota licenses in a dynamic setting: Hong Kong. Most welfare analyses of the effects of quotas have been based on static models that assume perfect competition in all relevant markets. Krishna and Tan extend these models to dynamic situations and test for perfect competition in the market for apparel quota licenses. Using monthly data from Hong Kong on license prices and utilization, they find evidence of imperfect competition in the market for apparel quota licenses, though.

Inspired by the case of Mexico, **Elizondo and Krugman** suggest that the existence of giant cities in developing countries is a consequence of the strong forward and backward linkages that arise when manufacturing tries to serve a small domestic market. These linkages are much weaker when the economy is open to international trade. In other words, the giant Third World metropolis is an unintended by-product of import substitution policies, and will tend to shrink as developing countries liberalize.

Brainard develops a model in which firms choose between exporting and foreign investment as alternative modes of penetrating foreign markets. Foreign investment is more likely if transport costs relative to fixed plant cost: are greater, and if increasing returns at the corporate level relative to the plant level are greater.

Brainard also establishes conditions for a mixed equilibrium, in which national and multinational firms coexist.

Aizenman examines how the threat of managed trade can lead to foreign direct investment (FDI). A

"The giant Third World metropolis is an unintended by-product of import substitution policies, and will tend to shrink as developing countries liberalize."

switch from free to managed trade may occur as the result of a cost-benefit assessment by the two countries. Under managed trade, the patterns of international commerce are the outcome of costly bargaining. Aizenman shows that capital mobility, and the

diversification of production achieved by FDI, reduce the incentive of one country to switch to managed trade. Thus FDI induced by the threat of managed trade benefits both the host country and the multinationals, which explains the relative tolerance toward FDI.

Eaton and **Kortum** model the process of technological innovation, and the diffusion of technologies across countries, using data from the top five OECD research economies: France, Germany, Japan, the United Kingdom, and the United States. They relate a country's relative productivity to its ability to innovate, to absorb foreign technologies, and to the state of technology abroad. Under certain conditions, the international diffusion of technologies will lead to convergence to a common, long-run growth rate of productivity. Levels of relative productivity among countries will depend upon national differences in the ability to innovate and imitate, though. Under other conditions, countries will evolve into separate blocs with different long-run growth rates.

Public Economics Program Meeting

The NBER's Program in Public Economics, directed by James M. Poterba of MIT, met on April 15 and 16 in Cambridge. Their agenda was:

Carlo Perroni, University of Western Ontario, and **John Whalley**, NBER and University of Western Ontario, "Base Broadening, VAT, and Indirect Tax Design"

Discussant: **Timothy J. Besley**, NBER and Princeton University

Roger H. Gordon and **Jeffrey K. MacKie-Mason**, NBER and University of Michigan, "Tax Distortions to the Choice of Organizational Form" (NBER Working Paper No. 4227)

Discussant: **Michael Graetz**, Yale University

B. Douglas Bernheim, NBER and Princeton University, and **Adam Wantz**, Shepard International, Inc., "A Tax-Based Test of the Dividend Signaling Hypothesis" (NBER Working Paper No. 4244)

Discussant: **Alan J. Auerbach**, NBER and University of Pennsylvania

Jonathan Gruber, NBER and MIT, and **James M. Poterba**, "The Elasticity of Demand for Health Insurance: Evidence from the Self-Employed"

Discussant: **Martin Feldstein**, NBER and Harvard University

Hilary W. Hoynes, NBER and University of California, Berkeley, and **Thomas E. Macurdy**, NBER and Stanford University, "Welfare Spells Over the Last Two Decades: Do Changes in Benefits Explain the Trends?"

Discussant: **Lisa M. Lynch**, NBER and MIT

Douglas Holtz-Eakin, NBER and Syracuse University; **David Joulfaian**, U.S. Department of Treasury; and **Harvey S. Rosen**, NBER and Princeton University, "Sticking It Out: Entrepreneurial Survival and Liquidity Constraints"

Discussant: **Michael Rothschild**, NBER and University of California, San Diego

Angus S. Deaton, NBER and Princeton University, and **Serena Ng**, Princeton University, "Parametric and Nonparametric Approaches to Price and Tax Reform"

Discussant: **Jonathan S. Skinner**, NBER and University of Virginia

Perroni and **Whalley** discuss the implications of rents and regulations for the design of indirect taxes, including VATs (value-added taxes). Intuition suggests high tax rates on industries or products with rents, but the authors argue that whether rents are caused by fixed factors or related to monopolistic market structure makes a big difference. In the latter case, a high tax may induce adverse behavioral changes. Analyzing Canadian data, Perroni and Whalley find that the ways in which taxes should deviate from uniformity depend crucially on the mechanisms that generate rents. A broadly based uniform tax typically will not be the optimal choice for economies in which rents represent a significant share of value added. Finally, the presence of rents substantially affects measures of the social costs of indirect taxes, both in total and at the margin, and in both directions, depending upon the nature of the rents involved.

Gordon and **MacKie-Mason** estimate the size of the nontax advantage to incorporating in various industries that is consistent with the organizational form chosen by investors in different tax brackets. While they find that these nontax costs can be large, noncorporate activity tends to be concentrated in industries in which these costs are small. Therefore, there is little excess burden from the tax distortion to organizational form.

Bernheim and **Wantz** find a strong positive relationship between dividend tax rates and the response of share prices to a dollar of dividends. This result supports the dividend signaling hypothesis, and is consistent with alternatives. The authors also corroborate their results using the relationship between the share price response and bond ratings.

To generate new estimates of the elasticity of demand for health insurance, **Gruber** and **Poterba** analyze the introduction of a tax subsidy to self-employed persons in the Tax Reform Act of 1986. They focus on the price sensitivity of the decision to purchase insurance, rather than on the decision of how much insurance to buy conditional on purchase. They find that a 1 percent increase in the cost of insurance coverage reduces the probability that a self-employed household will be insured by between 1 and 1.5 percent

Hoynes and **MaCurdy** focus on spells of participation in AFDC (Aid to Families with Dependent Children) during 1968 to 1988 and find three phases: modest increases in spell lengths before 1974; quite dramatic decreases in spell lengths between 1974 and 1982; and modest increases in spell lengths after 1982. Although there were large changes in the characteristics of women on AFDC during

the sample period, that played a negligible role in explaining the trends. On the other hand, changes in benefits available to female-headed households track average welfare experiences remarkably well: they explain a substantial portion of the change in AFDC spells over the sample period. Benefits have a large effect early in the welfare spell, but no effect as spells get longer.

Holtz-Eakin, **Joulfaian**, and **Rosen** ask why some individuals survive as entrepreneurs and others do not. They use data from 1981 and 1985 federal individual income tax returns for a group of people who received inheritances. These data allow them to identify individuals who were sole proprietors in 1981, and to determine the extent to which the decision to remain a sole proprietor was influenced by the size of the inheritance. The authors find that liquidity constraints exert a noticeable influence on the viability of entrepreneurial enterprises. For example, an inheritance of \$150,000 increases the probability that an individual will continue as a sole proprietor by 1.3 percentage points; if the enterprise survives, its receipts will increase by almost 20 percent.

Deaton and **Ng** note that, in the analysis of price reform, the measurement of efficiency effects requires knowing how tax-induced price changes affect quantities supplied and demanded. They consider the use of "average derivative estimators," and apply both parametric and

nonparametric analysis to price reform of foods in rural Pakistan.

Workshop on Macroeconomic History

An NBER workshop on macroeconomic history, organized by Research Associates N. Gregory Mankiw, Harvard University, and Christina D. Romer, University of California, Berkeley, took place in Cambridge on April 23. The program was:

Stefan E. Oppers, Harvard University, "Modeling the Bimetallic System: A Target-Zone Approach"

Discussant: **Peter M. Garber**, Brown University

Kevin O'Rourke, University College, Dublin; **Alan M.**

Taylor, Harvard University; and **Jeffrey G. Williamson**, NBER and Harvard University, "Land, Labor, and the Wage-Rental Ratio: Factor Price Convergence in the Late Nineteenth Century" (NBER Historical Paper No. 46)

Discussant: **Gregory Clark**, University of California, Davis

Robert J. Gordon, NBER and Northwestern University, "American Economic Growth: One Big Wave?"

Discussant: **Adam B. Jaffe**, NBER and Harvard University

Herschel I. Grossman, NBER and Brown University, and **Taejoon Han**, Brown University, "War Debt, Moral Hazard, and the Financing of the Confederacy"

Discussant: **Matthew D. Shapiro**, NBER and University of Michigan

Ben S. Bernanke, NBER and Princeton University, and **Kevin Carey**, Princeton University "Wage Stickiness and Aggregate Supply in the Great Depression"

Discussant: **Peter Temin**, NBER and MIT

Michael D. Bordo, NBER and Rutgers University; **Ehsan U. Choudhri**, Carleton University; and **Anna J. Schwartz**, NBER, "Could Stable Money Have Averted the Great Depression?"

Discussant: **James H. Stock**, NBER and Harvard University

Oppers argues that bimetallic arbitrage between the bullion markets and the French monetary system alone cannot explain the remarkable stability of the gold/silver price ratio during the nineteenth century. He demonstrates how the bimetallic mint ratios of major countries acted as absorbing barriers to the gold/silver price ratio. The behavior of the gold/silver price ratio and interest rate differentials between gold standard and silver standard countries is consistent with Oppers's model.

O'Rourke, Taylor, and Williamson study factor price convergence between the Old World and the New during the late nineteenth century, when economic convergence among the current OECD countries was dramatic. The authors look in particular at land and labor, the two most important factors of production in the nineteenth century. They find that wage-rental ratios boomed in the Old World and collapsed in the New, moving the resource-rich and labor-scarce New World closer to the resource-scarce and labor-abundant Old World.

Gordon shows that the standard data on output, labor input, and capital input imply "one big wave" in multi-factor productivity (MFP) growth. There was little MFP growth in the late nineteenth century, then an acceleration peaking in 1928–50, and then a deceleration to a slow rate after 1972 that returns to the poor performance of 1871–1913. Gordon's corrections to capital input make a substantial difference to the timing of the big wave. After these corrections, the peak of MFP growth is in 1950–64, not 1928–50. MFP growth in 1913–64 is now 82 percent higher than in 1964–88, rather than 260 percent higher as implied by the standard capital input data. Still, MFP growth before 1913 and after 1964 was much slower than between 1913 and 1964. One solution to the puzzle may lie in the history of innovation; a chronology of "radically new products" shows that the peak period for such innovations was 1920 to 1950.

Grossman and Han find that the Confederacy undertook little external borrowing because it had large resources that could be mobilized. Further, the moral hazard associated with war debt had little effect on the policies of the Confederacy. However, the lack of importance of the moral hazard associated with war debt is not a generic property of war finance, Grossman and Han conclude.

Bernanke and Carey examine data from 22 countries and find that nominal wage stickiness was the source of monetary nonneutrality in the Depression. That is, given their price levels, countries with higher nominal wages suffered worse depressions. However, the time-series evidence for the role of wage stickiness is weaker. In particular, the strong world recovery that began in 1932 occurred without much reduction in real wages.

Bordo, Choudhri, and Schwartz test the hypothesis that the Great Depression would have been attenuated if the Fed had kept the money stock from declining. They find that the Great Depression would have been mitigated and shortened if the Fed had continued to maintain the 1922–9 average growth rate of M2 from 1929 to 1933.

Monetary Economists Meet

Members and guests of the NBER's Program in Monetary Economics gathered in Cambridge on April 30 for

their spring meeting. Benjamin M. Friedman and N. Gregory Mankiw, both of Harvard University, organized this program:

Donald P. Morgan, Federal Reserve Bank of Kansas City, "Bank Loan Commitments and the Lending View of Monetary Policy"

Discussant: **Jeremy C. Stein**, NBER and MIT

Valerie A. Ramey, NBER and University of California, San Diego, "How Important Is the Credit Channel in the Transmission of Monetary Policy?" (NBER Working Paper No. 4285)

Discussant: **Jeffrey A. Miron**, NBER and Boston University

Mariano Tomassi, University of California, Los Angeles, "Inflation and Relative Prices: Evidence from Argentina"

Discussant: **Laurence M. Ball**, NBER and Princeton University

Marvin Goodfriend, Federal Reserve Bank of Richmond, "Interest Rate Policy and the Inflation Scare Problem"

Discussant: **Charles Freedman**, Bank of Canada

John B. Taylor, NBER and Stanford University, "Macroeconomic Policy in a World Economy: From Econometric Design to Practical Operation"

Morgan argues that smaller firms without loan commitments bear the brunt of any lending channel of monetary policy. He finds that loans *not* under commitment decline promptly after policy is tightened, while loans under commitment never decline significantly. The share-of-loans-not-under-commitment (SNUC) often outpredicts money and, with the federal funds rate included, is the best predictor of output. Innovations in SNUC explain more of the innovations in output than money or the funds rate do. Decreases in SNUC precede increases in the spread between commercial paper and Treasury bill rates, suggesting that this spread signals bank "credit crunches."

Ramey tests the importance of the credit channel in the transmission of monetary policy by analyzing three credit variables: total bank loans; bank holdings of securities relative to loans; and the difference in the growth rates of short-term debt of small and large firms. She finds that in most cases, the credit variables do not play a significant role in the effect of monetary policy shocks on output.

Tomassi analyzes the effects of inflation at the level of individual stores, using weekly grocery prices from Argentina in 1990. He finds that the higher inflation is, the less informative current prices are about future prices. The evidence also suggests that price-setting procedures, such as the use of markdowns, do vary with the inflation regime.

Goodfriend analyzes Fed interest rate policy since 1979. He focuses on the acquisition and maintenance of

credibility for the commitment to low inflation. Measuring credibility by movements of inflation expectations reflected in the long-term interest rate, Goodfriend finds that the Fed's policy actions for much of the period were directed at resisting inflation scares signaled by large sustained increases in the long rate.

Taylor presents a structural model of the G-7 that incorporates rational expectations, staggered wage setting, international capital mobility, and efficient capital markets. He describes the properties of the preferred monetary policy rule, and illustrates its practical operation using recent monetary history in the United States.

Behavioral Economics and Finance

The NBER's working group on behavioral economics and finance, directed by NBER Research Associates Robert J. Shiller of Yale University and Richard H. Thaler of Cornell University, convened in Cambridge on May 14. At their meeting, sponsored by the Russell Sage Foundation, they discussed:

James N. Bodurtha, Jr., University of Michigan;
Dong-Soon Kim, Ssang Yong Research Institute;
and **Charles M. C. Lee**, University of Michigan,
"Closed-End Country Funds and U.S. Market
Sentiment"

Discussant: **Richard J. Zeckhauser**, NBER and
Harvard University

François Degeorge, Harvard University, "Fad Behavior in Initial Public Offerings: Evidence from IPOs Issued Before and After the Stock Market Crash"

Discussant: **Werner de Bondt**, University of Wisconsin, Madison

Narasimhan Jegadeesh and **Sheridan Titman**, University of California, Los Angeles, "Overreaction, Delayed Reaction, and Contrarian Profits"

Discussant: **Robert J. Shiller**

Josef Lakonishok, University of Illinois; **Andrei Shleifer**, NBER and Harvard University; and **Rob W. Vishny**, NBER and University of Chicago, "Contrarian Investment, Extrapolation, and Risk" (NBER Working Paper No. 4360)

Discussant: **Richard H. Thaler**

Robert S. Chirinko, University of Chicago, and **Huntley Schaller**, Carleton University, "Bubbles, Fundamentals, and Investments: A Multiple Equation Specification Testing Strategy"

Discussant: **David S. Scharfstein**, NBER and MIT

Kaushik Amin and **H. Nejat Seyhun**, University of Michigan, "Is There Positive Feedback Trading in Index Options Markets?"

Discussant: **Jeremy C. Stein**, NBER and MIT

Bodurtha, Kim, and Lee observe that the premiums on closed-end country funds tend to move in tandem, but do not move together with the premiums on domestic closed-end funds. After controlling for foreign market fundamentals, they find that changes in the stock price of country funds comove with U.S. market returns, but changes in their net asset values do not. An index of changes in country fund premiums explains cross-sectional stock returns in the U.S. market, particularly for small firms. These findings suggest that U.S. stock prices are affected by marketwide sentiments that are reflected in closed-end country fund premiums.

Degeorge compares initial public offerings (IPOs) issued immediately before the stock market crash of October 1987 with those issued immediately afterward. Using two measures of stock price performance, he finds that over their first 24 months of trading, and excluding the crash period, pre-crash IPOs performed poorly. Post-crash IPOs performed well over the same horizon. Over the 18 months following the crash, pre-crash IPOs underperformed post-crash IPOs. Earnings news was not a primary factor in adjusting investors' expectations. At least in the period surrounding the crash, IPO performance was driven by exogenous investor sentiment rather than by an endogenous IPO fad. Finally, the sharp change in IPO volume before versus after the crash may have been attributable at least partly to fads.

Jegadeesh and Titman decompose short-horizon contrarian profits into various sources by using firm-specific information to analyze stock price reactions to common factors. In sharp contrast to the conclusions in the extant literature, they find that the lead-lag structure in stock prices contributes less than 5 percent of the observed contrarian profits. Most of the profits are attributable to stock price overreaction.

Historically, investing in "value stocks" (which have low prices relative to earnings, dividends, historical prices, book assets, or other measures of value) has produced superior average returns. Some have argued that this is because value stocks are riskier than other stocks. **Lakonishok, Shleifer, and Vishny** show that value stocks are not unusually risky. They argue instead that the superior performance of value strategies is caused by the fact that the market extrapolates past growth performance, overpricing glamour stocks and underpricing value stocks.

Chirinko and Schaller note that dramatic fluctuations in the stock market raise questions about whether actual prices correspond to fundamentals. Even if there are "bubbles," they may not distort real behavior if firms ignore them when making investment decisions. On the other hand, overvaluation of shares could provide firms

with a relatively cheap source of finance and therefore might influence their investment decisions. The authors find that firms rely on their own expectations and do not take advantage of bubbles to obtain cheap financing, despite evidence that bubbles exist.

Amin and Seyhun examine Standard & Poor's 100 Index options (OEX options) prices from 1985–91. They find that OEX calls are significantly "overvalued" relative to OEX puts after large price increases, and that OEX puts are significantly "overvalued" relative to calls after large price decreases. This phenomenon exists for all the different maturity OEX options, even after excluding a six-month period after the 1987 crash. They interpret these findings to indicate that large numbers of individual investors and portfolio managers follow trend-chasing behavior.

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1799. "Alcohol Control Policies and Motor Vehicle Fatalities," by Frank J. Chaloupka, Henry Saffer, and Michael Grossman (NBER Working Paper No. 3831)
1800. "The Present-Value Model of Rational Commodity Pricing," by Robert S. Pindyck (NBER Working Paper No. 4083)
1801. "Methodological Issues and the New Keynesian Economics," by Joseph E. Stiglitz (NBER Working Paper No. 3580)
1802. "Technological Change and Retirement Decisions of Older Workers," by Ann P. Bartel and Nachum Sicherman (NBER Working Paper No. 3433)
1803. "Comprehensive Income Taxation, Investments in Human and Physical Capital, and Productivity," by Marc Nerlove, Assaf Razin, Efraim Sadka, and Robert K. von Weizsäcker (NBER Working Paper No. 3531)
1804. "The Impact of Terms of Trade Shocks on a Small Open Economy: A Stochastic Analysis," by Stephen J. Turnovsky (NBER Working Paper No. 3916)
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Bureau Book

Card/Freeman Volume Is Published

The first volume in the new NBER Comparative Labor Market Series, *Small Differences that Matter: Labor Markets and Income Maintenance in Canada and the United States*, will be available in August from the University of Chicago Press. Edited by David Card and Richard B. Freeman, this book is priced at \$29.95.

Using microdata on thousands of individuals in Canada and the United States, the authors of the seven papers in the volume show that small differences in policies and institutions can affect the labor market and family income, both directly and indirectly. For example, Canada's social safety net, more generous than the American one, produced markedly lower poverty rates

during the 1980s and helped offset the forces leading to the rising income inequality that swept the United States. One paper estimates that adoption of the Canadian program in the United States essentially would eliminate poverty among children. On the other hand, transfer programs cost Canadians two to three times more per person than Americans spent, and sharply increased government indebtedness. Differences in immigration policy, rates of unionization, participation in the labor force, and other factors all are shown to contribute to differences in employment and earnings between the United States and Canada.

This volume is written fairly nontechnically and should interest a wide range of readers. Card is a research associate in the NBER's labor studies program and a professor at Princeton University. Freeman directs the NBER's Program in Labor Studies and is a professor at Harvard University.

This book may be ordered directly from the University of Chicago Press, Order Department, 11030 South Langley Avenue, Chicago, IL 60628-2215. Academic discounts of 10 percent for individual volumes and 20 percent for standing orders for *all* NBER books published by the University of Chicago Press are available to university faculty; orders must be sent on university stationery.

Current Working Papers

Individual copies of NBER Working Papers, Historical Factors in Long-Run Growth Papers, and Technical Papers are available free of charge to corporate associates. For all others, there is a charge of \$5.00 per paper requested. (Outside of the United States, add \$10.00 per order for postage and handling.) Advance payment is required on all orders. Please do not send cash. For further information or to order, please write: National Bureau of Economic Research, 1050 Massachusetts Avenue, Cambridge, MA 02138-5398.

Journal of Economic Literature (JEL) subject codes, when available, are listed after the date of the paper, followed by the NBER program(s) of research represented by each paper. Papers not associated with an NBER program are listed as Miscellaneous. All Historical Factors in Long-Run Growth Papers are in the Development of the American Economy program.

Abstracts of all papers issued since April are presented below. For previous papers, see past issues of the *NBER Reporter*. Working Papers are intended to make results of NBER research available to other economists in preliminary form to encourage discussion and suggestions for revision before final publication. They are not reviewed by the Board of Directors of the NBER.

NBER Working Papers

The Gold Standard, Bretton Woods, and Other Monetary Regimes:

A Historical Appraisal

Michael D. Bordo

NBER Working Paper No. 4310

April 1993

JEL Nos. F33, E42, N20

Development of the American Economy, International Finance and Macroeconomics, Monetary Economics

This paper answers two questions: first, which international monetary regime is best for economic performance: one based on fixed exchange rates, including the gold standard and its variants; adjustable peg regimes, such as the Bretton Woods system and the European Monetary System; or one based on floating exchange rates?

Second, why have some monetary regimes been more successful than others? Specifically, why did the classical gold standard last nearly a century (at least for Great Britain) and Bretton Woods for only 25 years (or less)? And why was the European Monetary System successful for only a few years?

I examine empirical evidence on the performance of the classical gold standard, Bretton Woods, and the current float, and use the mixed-regime interwar period as a backdrop. I then link a regime's success to the presence of credible commitment mechanisms: that is, to the incentive compatibility features of the regime. In addition to being based on simple transparent rules, successful fixed rate regimes encouraged a center country to enforce the rules and other countries to comply.

Heterogeneity, Stratification, and Growth

Roland Bénabou

NBER Working Paper No. 4311

April 1993

JEL Nos. O41, I21, D62

Growth

How does economic stratification affect inequality and growth over time? In economies where heterogeneous agents interact through local public goods or externalities (school funding, neighborhood effects) and where economywide linkages (complementary skills, knowledge spillovers) exist, I compare growth and welfare when families are stratified into homogeneous local communities versus when they remain integrated. Segregation (or stratification) tends to minimize the losses from a given amount of heterogeneity, but integration reduces heterogeneity more quickly. Society thus may face an intertemporal trade-off: mixing (integration) leads to slower growth in the short run, but to higher output, or even productivity growth, in the long run. This trade-off occurs in particular with local versus national funding of education, corresponding to special cases of segregation and integration. More generally, I identify

the key parameters that determine which structure is more efficient over short and long horizons. The degrees of complementarity in local and in global interactions are particularly important.

Does History Matter Only When It Matters Little? The Case of City-Industry Location

James E. Rauch

NBER Working Paper No. 4312

April 1993

JEL Nos. O41, R11, R32

Growth, International Trade and Investment

When will an industry subject to agglomeration economies move from an old, high-cost site to a new, low-cost site? History, in the form of sunk costs resulting from the operation of many firms at a site, creates a disadvantage for first movers that can prevent relocation. Developers of industrial parks can partly overcome this inertia through discriminatory pricing of land over time. The empirical evidence shows that they actually engage in such behavior. I also show that other aspects of developer land-sale strategy can be a source of information on the nature of interfirm externalities.

Productivity and the Density of Economic Activity

Antonio Ciccone and Robert E. Hall

NBER Working Paper No. 4313

April 1993

JEL Nos. O40, O47, R12

Economic Fluctuations, Growth

Two different models—one based on local geographical externalities, and the other on the variety of immediate services that are available only locally—give rise to a simple, estimable relationship between employment density and productivity. Using data on gross state output for the United States, we find that agglomeration more than offsets congestion effects in denser areas. While our estimate of the elasticity of productivity with respect to density is small, it explains more than half of the observed state differences in productivity, given the large differences in density.

Arbitrage Chains

James Dow and Gary Gorton

NBER Working Paper No. 4314

April 1993

JEL No. G12

Asset Pricing

In efficient markets, the price should reflect the arrival of private information. The mechanism by which this is accomplished is arbitrage. A privately informed trader will engage in costly arbitrage, that is trade, on his knowledge that the price of an asset is different from the fundamental value if: 1) his order does not move the

price immediately to reflect the information; and 2) he can hold the asset until the date when the information is reflected in the price.

We study a general equilibrium model in which all agents optimize. In each period, there may be a trader with a limited horizon who has private information about a distant event. Whether he acts on his information, and whether subsequent informed traders act, depends on the possibility of a sequence or *chain* of future informed traders spanning the event date. An arbitrageur who receives good news will buy only if it is likely that, at the end of his trading horizon, a subsequent arbitrageur's buying will have pushed up the expected price. We show that limited trading horizons result in inefficient prices because informed traders do not act on their information until the event date is sufficiently close.

Profitable Informed Trading in a Simple General Equilibrium Model of Asset Pricing

James Dow and Gary Gorton
NBER Working Paper No. 4315
April 1993
JEL No. G12
Asset Pricing

This paper presents a simple general equilibrium model of asset pricing in which profitable informed trading can occur without any "noise" added to the model. We show that models of profitable informed trading must restrict the portfolio choices of uninformed traders: in particular, those traders cannot buy the market portfolio. In this model, profitable informed trading lowers the welfare of all agents when compared across steady states.

Poison or Placebo? Evidence on the Deterrent and Wealth Effects of Modern Antitakeover Measures

Robert Comment and G. William Schwert
NBER Working Paper No. 4316
April 1993
JEL Nos. G34, G38
Corporate Finance

We show that poison pill rights issues, control share statutes, and business combination statutes do not deter takeovers and did not cause the demise of the 1980s' market for corporate control. Still, 87 percent of all firms listed on the exchange are now covered by one or another of these antitakeover measures.

We also show that poison pills and control share statutes are associated with higher takeover premiums for selling shareholders, both unconditionally and conditional on a successful takeover. We provide updated event-study evidence for the three-quarters of all poison pills not yet analyzed.

Monetary Policy and Bank Lending

Anil K. Kashyap and Jeremy C. Stein
NBER Working Paper No. 4317
April 1993
Monetary Economics

This paper surveys recent work on the "lending" view of monetary policy transmission. Its three main goals are: 1) to explain why it is important to distinguish between the lending and "money" views of policy transmission; 2) to outline the microeconomic conditions that are needed to generate a lending channel; and 3) to review the empirical evidence that bears on the lending view.

Dynamic Efficiency in the Gifts Economy

Stephen A. O'Connell and Stephen P. Zeldes
NBER Working Paper No. 4318
April 1993
JEL Nos. D51, E13, E2, E6, H55
Economic Fluctuations

In the standard analysis of an overlapping-generations economy with gifts from children to parents, each generation takes the actions of all other generations as given. The resulting "simultaneous moves" equilibrium is dynamically inefficient. In reality, however, parents precede children in time and realize that children will respond to higher parental saving by reducing their gifts. Incorporating this feature lowers the effective return to saving, resulting in lower steady-state capital accumulation. Our analysis overturns the standard presumption of dynamic inefficiency in the gift economy. This reestablishes the potential relevance of the gift model to the U.S. economy, renders moot an important part of the debate on Ricardian Equivalence, extends the recent literature on the effects of implicit taxation on capital accumulation, and provides a motivation for the presence of a Social Security type of system that unconditionally transfers resources from young to old.

The Political Economy of Inflation and Stabilization in Developing Countries

Sebastian Edwards
NBER Working Paper No. 4319
April 1993
JEL No. F41
International Finance and Macroeconomics

This paper deals with political aspects of inflation and stabilization in developing countries. I argue that, by ignoring political considerations, traditional models fail to fully understand the dynamics of inflation. I discuss several newer models, some based on strategic government behavior and war of attrition. I also use data on Chile to test several versions of political business cycle models. This perspective helps to explain the evolution of inflation through time in Chile. Finally, I use data on a large cross section of countries to investigate the political economy surrounding major devaluation crises.

Exchange Rates, Inflation, and Disinflation: Latin American Experiences

Sebastian Edwards

NBER Working Paper No. 4320

April 1993

JEL No. F31

International Finance and Macroeconomics

This paper analyzes the relationship among exchange rates, inflation, and disinflation in Latin America. First I investigate the historical experience with fixed exchange rates in four Latin American countries. I show that, even though these countries had the ability to undertake independent monetary policy, they chose to play by the "rules of the game." Until 1973, the time of the first oil shock, these countries strictly respected the constraints imposed by fixed exchange rates on their domestic credit policy. Between that date and the late 1980s, when fixed rates finally were abandoned, the countries tried to ignore these constraints. This generated losses of reserves and increased inflation. Second, I refer to the use of a nominal exchange rate anchor to reduce inflation. Using data on Chile, Mexico, and Venezuela, I find that fixing the exchange rate, on its own, will not reduce the degree of inertia.

Environmental Regulation and Manufacturing Productivity at the Plant Level

Wayne B. Gray and Ronald J. Shadbegian

NBER Working Paper No. 4321

April 1993

JEL Nos. D24, Q28

Productivity

We analyze the connection among productivity, pollution abatement expenditures, and other measures of environmental regulation for plants in three industries (paper, oil, and steel). We examine data from 1979 to 1985, considering both labor and total factor productivity (TFP), both levels and rates of growth, and both annual and average measures over the period. We find a strong connection between regulation and productivity when regulation is measured by compliance costs. More regulated plants have significantly lower productivity levels and slower productivity growth rates than less regulated plants do. The magnitude of the impacts are larger than expected: a \$1 increase in compliance costs appears to reduce TFP by the equivalent of \$3 to \$4. Thus, commonly used methods of calculating the impact of regulation on productivity are underestimated substantially. Other measures of regulation (compliance status, enforcement activity, and emissions) show much less consistent results. Higher enforcement, lower compliance, and higher emissions generally are associated with lower productivity levels and slower productivity growth, but the coefficients are rarely significant.

Monetary Policy and Inflation in the 1980s: A Personal View

Martin Feldstein

NBER Working Paper No. 4322

April 1993

JEL No. E5

Economic Fluctuations, Monetary Economics

This paper, which was written as a part of the NBER project on American economic policy in the 1980s, reviews some of the major changes in monetary policy during that period. The paper tries to explain why policies changed in the way that they did, and looks particularly at the role of economists and economic analysis in shaping those developments.

Tax Policy in the 1980s: A Personal View

Martin Feldstein

NBER Working Paper No. 4323

April 1993

JEL No. H2

Public Economics

The tax reforms of the 1980s were the most substantial tax changes since the dramatic expansion of personal taxation during World War II. This paper, which was written as part of the NBER project on American economic policy in the 1980s, examines the nature of these changes, and discusses why tax policies evolved as they did. I pay particular attention to the role of economic analysis in shaping the tax reforms.

Government Spending and Budget Deficits in the 1980s: A Personal View

Martin Feldstein

NBER Working Paper No. 4324

April 1993

JEL No. H6

Economic Fluctuations, Public Economics

This paper, which was written as part of the NBER project on American economic policy in the 1980s, examines the changes in government spending and budget deficits during the decade. It analyzes why the deficit increased substantially, and looks at the policy options that were considered for reducing the deficit. The paper discusses the period when I was a member of the administration in greater detail than other years in the 1980s, and seeks to explain why the policy choices evolved as they did.

The Dollar and the Trade Deficit in the 1980s: A Personal View

Martin Feldstein

NBER Working Paper No. 4325

April 1993

JEL No. F4

Economic Fluctuations, International Finance and Macroeconomics, International Trade and Investment, Monetary Economics

The sharp gyrations of the dollar and of the trade deficit in the 1980s were among the most novel and least

understood economic developments of the decade. This paper, which was written as part of the NBER project on American economic policy in the 1980s, examines the reasons for the dollar's swings, and the nature of the policy debate about the appropriate government response to the rising and then falling dollar.

Historical Perspectives on the Monetary Transmission Mechanism

Jeffrey A. Miron, Christina D. Romer, and David N. Weil

NBER Working Paper No. 4326

April 1993

JEL Nos. E40, E50, N10, N20

Monetary Economics

This paper examines changes over time in the importance of the lending channel in the transmission of monetary shocks to the real economy. First we isolate the observable factors that affect the strength of the lending channel. Then we show that, based on changes in the structure of banks' assets, reserve requirements, and the composition of external firm finance, the lending channel should have been stronger before 1929 than during the post-World War II period, especially the first half of this period. Finally, we demonstrate that conventional indicators of the importance of the lending channel, such as the spread between the loan rate and the bond rate, and the correlation between loans and output, do not show the predicted decline in the importance of lending over time. From this we conclude that either the traditional indicators are not useful measures of the strength of the lending channel, or that the lending channel has not been quantitatively important in any era.

Determinants of Young Male Schooling and Training Choices

Stephen V. Cameron and James J. Heckman

NBER Working Paper No. 4327

April 1993

Labor Studies

This paper examines the determinants of acquiring a high school certification by exam (GED), graduating from high school, and choosing postsecondary training and schooling. The determinants of a GED are fundamentally different from the determinants of ordinary graduation from high school. GED graduates are more likely to take vocational and technical training, while ordinary graduates are more likely to attend academic programs. GED recipients are much less likely to complete the postsecondary programs they begin. The GED exam does not measure the ability or motivation that predicts successful completion of postsecondary schooling and training programs. Participation in postsecondary non-academic training is *positively* related to family resources. Thus, both academic and nonacademic training operate to reinforce initial inequalities in family earnings.

Intertemporal Choice and Inequality

Angus Deaton and Christina H. Paxson

NBER Working Paper No. 4328

April 1993

JEL Nos. D31, D91

Aging, Economic Fluctuations

Standard models of intertemporal choice, including the permanent-income hypothesis, imply that, for any given cohort of people, inequality in consumption and income will grow with age. At any given date, each individual's consumption depends on the integral of unanticipated earnings shocks up to that date; consumption becomes more dispersed with time. If earnings themselves do not disperse similarly, then assets will, so that the dispersion of total income will increase regardless of the behavior of earnings. Because the result applies to an increase in inequality over time within a given age cohort, it has no immediate implications for the behavior of inequality in the economy as a whole, and is consistent with constant aggregate inequality over time.

We construct cohort data from 11 years of household surveys from the United States, 22 years from Great Britain, and 14 years from Taiwan. We show that consumption and income inequality within cohorts indeed grows with age in all three economies, and that the rate of increase is broadly similar in all three.

Where Do Betas Come From?

Asset Price Dynamics and the Sources of Systematic Risk

John Y. Campbell and Jianping Mei

NBER Working Paper No. 4329

April 1993

JEL No. G12

Asset Pricing

This paper breaks assets' betas with common factors into components attributable to news about future cash flows, real interest rates, and excess returns. The betas of industry and size portfolios with the market are attributed largely to changing expected returns. Betas with inflation and industrial production reflect opposing cash flow and expected return. We also show how asset pricing theory restricts the expected excess return components of betas.

Saving, Growth, and Aging in Taiwan

Angus Deaton and Christina H. Paxson

NBER Working Paper No. 4330

April 1993

JEL Nos. D91, J14, E21

Aging

This paper examines household saving, growth, and aging in Taiwan. The Taiwanese patterns of high income growth, declines in fertility, and increases in life expectancy all have implications for life-cycle saving. We use data from 15 consecutive household income and expenditure surveys, from 1976 to 1990, to examine whether

observed profiles of consumption and saving are consistent with life-cycle theory. The patterns of consumption and saving across households of different ages and cohorts appear to be broadly consistent with a life-cycle model. However, the data also indicate that household consumption tracks income closely, and this evidence casts doubt on simple life-cycle theory.

U.S. Manufacturing and an Emerging Mexico

Edward E. Leamer and Chauncey J. Medberry

NBER Working Paper No. 4331

April 1993

International Trade and Investment

This paper offers a vision of the future of trade in manufactured products between Mexico and the United States. We analyze a study of the 1970 and 1985 trade patterns of OECD countries. We also account directly for the proximity of Mexico and the United States, and for the continuing wage gap between Mexico and the United States. Indirectly, we consider the declining level of trade barriers, and the technological improvements that are probable in a liberalized Mexico.

Based on the OECD trade patterns, an emerging Mexico will present opportunities for U.S. exports that represent a significant fraction of current U.S. production of transportation equipment, chemicals, and machinery. But Mexican exports are likely to displace a substantial amount of the U.S. production of apparel, footwear, pottery, and leather products.

This vision, formed using 1985 data, does not offer an entirely accurate description of the changes in trade between Mexico and the United States that have occurred between 1985 and 1992. It is possible that the vision is defective, but it is also possible that the Mexican liberalization is incomplete, is in its infancy, and is still under serious threat of reversal.

Demographic Factors and Real House Prices

Richard K. Green and Patric H. Hendershott

NBER Working Paper No. 4332

April 1993

JEL No. R21

Miscellaneous

Real house prices are determined directly by the willingness of households to pay for (and willingness of builders to supply) a constant quality house. Changes in the quantity of housing demanded will affect real prices only to the extent that the long-run housing supply schedule is positively sloped. We use 1980 Census data to measure the impact of the age structure and real income per household on the willingness of households to pay for a constant quality house. Extrapolating these variables forward to 2010, we conclude that evolving demographic forces are likely to raise real house prices, not lower them.

Keeping People Out: Income Distribution, Zoning, and the Quality of Public Education

Raquel Fernandez and Richard Rogerson

NBER Working Paper No. 4333

April 1993

JEL Nos. E62, H52, I22, J24

Public Economics

This paper examines the effect of community zoning regulations on allocations and welfare in a two-community model. Each community uses a local property tax to finance public education. Tax rates are determined by majority vote within each community, and individuals choose where to reside. We study both exogenously imposed zoning regulations and the case of the regulator being determined endogenously by majority vote. We find that, although zoning tends to make the rich community more exclusive, this need not increase the quality of education in the rich relative to the poor community. When zoning is introduced, some lower-income individuals benefit and some higher-income individuals are made worse off.

The Dynamic-Optimizing Approach to the Current Account: Theory and Evidence

Assaf Razin

NBER Working Paper No. 4334

April 1993

JEL Nos. F21, F43, H21, J13, J22, J24, O41

International Finance and Macroeconomics

This paper models investment and consumption (saving) in ways that emphasize intertemporal optimization and the differing effects of various shocks. Four different kinds of shocks are treated distinctly: transitory or persistent in duration, and common or idiosyncratic across countries. Incorporating these considerations brings out a body of evidence in support of the key propositions of the dynamic-optimizing approach.

Trade Blocs and Currency Blocs

Jeffrey A. Frankel and Shang-Jin Wei

NBER Working Paper No. 4335

April 1993

JEL Nos. F15, F3

International Finance and Macroeconomics,

International Trade and Investment

We find clear evidence of trading blocs in Europe, the Western Hemisphere, East Asia, and the Pacific. In Europe, it is the EC (European Community) that operates as a bloc. We estimate that two EC members trade 55 percent more with each other than can be explained by proximity, size, and GNP per capita. We also find some evidence of trade diversion in 1990. Even though the blocs fall along natural geographic lines, they may actually be "supernatural."

We also find a degree of intraregional stabilization of exchange rates, especially in Europe. Not surprisingly,

the European currencies link to the Deutschmark, and the Western Hemisphere countries peg to the dollar. East Asian countries also link to the dollar, not the yen. We find some evidence that bilateral exchange rate stability may have a small effect on trade. That is, if real exchange rate variability within Europe were to double, for example from 1990 to its 1980 level, then the volume of intraregional trade might fall by an estimated 0.7 percent.

Convergence in Growth Rates: A Quantitative Assessment of the Role of Capital Mobility and International Taxation

Assaf Razin and Chi-Wa Yuen

NBER Working Paper No. 4336

April 1993

JEL Nos. F21, F43, H21, J13, J22, J24, O41

Growth, International Finance and Macroeconomics

How do capital mobility and international taxation explain the observed cross-country diversity in long-run growth rates of *per capita* and *total* incomes, as well as population growth rates? Corroborating Razin and Yuen (1992), we show that: 1) growth in population and per capita income are both negatively correlated across countries; 2) the growth rates of total income are less variable than the growth rates of per capita income across countries; and 3) asymmetry in capital income tax rates, coupled with the residence principle of international income taxation, can be an important source of cross-country differences in per capita income growth. Although the effects on long-run growth of liberalizing capital flows may not be sizable, the effects of changes in capital income tax rates on growth can be much bigger with than without capital mobility because of cross-border policy spillovers.

Antitax Revolutions and Symbolic Prosecutions

Holger C. Wolf

NBER Working Paper No. 4337

April 1993

JEL Nos. H26, E62

Miscellaneous

I extend the traditional tax evasion model to take account of the interaction between individual compliance decisions and perceived detection probabilities. This generalization provides a rationale for "antitax revolutions," characterized by a sudden shift of a significant fraction of the taxpaying citizenry from compliance to evasion with unchanged fundamentals and monitoring rules. With an application to hyperinflation, I establish the possibility of multiple compliance equilibriums with lock-in effects. Finally, I demonstrate the potential cost effectiveness of "symbolic prosecution" in preference to permanent changes in the monitoring process as an equilibrium shifting device.

Evaluating the Connection Between Social Protection and Economic Flexibility

Rebecca M. Blank and Richard B. Freeman

NBER Working Paper No. 4338

April 1993

JEL Nos. J60, I30

Labor Studies

Over the last ten years, a variety of analysts have blamed high unemployment and stagnant economic growth in Europe on inflexible labor markets and pointed to the United States as a more flexible economy, because its labor markets are less regulated and the social protection programs less generous. This paper reviews that debate, critiques the arguments about the relationship between social protection programs and labor market adjustment, and reviews the research literature on this topic. In general, we conclude that much less is known about the aggregate effects of social protection programs on the economy than is generally claimed. Within the very limited existing research, there is little evidence of a significant trade-off between social programs and labor market adjustment, although there is also not much evidence to support those who claim that social protection promotes economic growth.

Public Sector Growth and Labor Market Flexibility: The United States Versus the United Kingdom

Rebecca M. Blank

NBER Working Paper No. 4339

April 1993

JEL No. J45

Labor Studies

This paper investigates whether a larger public sector limits labor market adjustment. I use data from the United States and the United Kingdom: two countries with quite different public/private employment trends. The results indicate that the two countries have a similar mix of occupations and workers in the public versus the private sector. Both countries have experienced some overall convergence of the public/private wage differential over the 1980s, although the extent of this differential varies substantially by occupation and gender. Both countries also have seen wage inequality in the public and private sectors increase over the past decade. Variability in public sector employment and wages over time is generally as great as in the private sector, although the cyclical patterns are different. The U.S. public sector, however, seems more responsive to changes in private sector demand than does the U.K. public sector. I conclude that the public sectors of both countries show a substantial amount of change and adaptation, particularly over the past decade.

Internationally Diversified Bond Portfolios: The Merits of Active Currency Risk Management

Richard M. Levich and Lee R. Thomas

NBER Working Paper No. 4340

April 1993

JEL Nos. G15, F31, G23

International Finance and Macroeconomics

Using daily currency futures prices for 1976 to 1990, we conclude that successive exchange rate changes have not been independent. We examine the implications of this finding for two groups of investors: 1) return-seeking investors considering foreign exchange as a separate asset class; and 2) international portfolio investors deciding whether or not to hedge the foreign exchange rate exposures embedded in their nondollar investments. Using the currency futures data and monthly data on ten-year dollar and nondollar bonds, we conclude that active currency risk management, based on a simple application of technical trading signals, can improve the risk-return opportunities substantially for both groups of investors in comparison to passive currency strategies.

Losers and Winners in Economic Growth

Robert J. Barro and Jong-Wha Lee

NBER Working Paper No. 4341

April 1993

JEL Nos. O4, J1

Growth, Economic Fluctuations

For 116 countries from 1965 to 1985, the lowest quintile had an average growth rate of real per capita GDP of negative 1.3 percent, whereas the highest quintile had an average positive rate of growth of 4.8 percent. We isolate five influences that discriminate reasonably well between the slow and fast growers: 1) a conditional convergence effect, whereby a country grows faster if it begins with lower real per capita GDP relative to its initial level of human capital, in the forms of educational attainment and health; 2) a positive effect on growth from a high ratio of investment to GDP (although this effect is weaker than reported in some previous studies); 3) a negative effect of overly large government; 4) a negative effect of government-induced distortions of markets; and 5) a negative effect of political instability. Overall, the fitted growth rates of 85 countries for 1965–85 had a correlation of 0.8 with the actual values.

We also find that female educational attainment has a pronounced negative effect on fertility, whereas both female and male attainment are positively related to life expectancy and negatively related to infant mortality. Male attainment is positively related to primary-school enrollment ratios, and male and female attainment are positively related to school enrollment at the secondary and higher levels.

Federal Reserve Policy: Cause and Effect

Matthew D. Shapiro

NBER Working Paper No. 4342

April 1993

JEL Nos. E52, E58

Monetary Economics, Economic Fluctuations

Romer and Romer (1989, 1990, 1992) identify dates when the Federal Reserve appears to have shifted its policy toward reducing the rate of inflation. This paper examines the economic context that drives these decisions. I find that the Fed weighs the outlook for unemployment as well as for inflation in making its decision about disinflation.

Previous work has not examined the course of inflation over the disinflations. I find that the inflation rate responds to the “disinflations” only when the effects of the policy are presumed to be permanent. Moreover, the Volcker disinflation is the only “disinflation” that reduces inflation permanently. The disinflation after the 1973 OPEC price increases was effective, but only temporarily. Other disinflations had negligible impacts on the rate of inflation over all horizons.

I construct variables that measure the expected present discounted values of unemployment and inflation and use them to explain the Fed’s decision to disinflate. This model explains the Fed’s decisions fairly well. I confirm that both inflation and unemployment drive the Fed’s decision. For some episodes, notably in the 1970s, inflation is the main variable driving the decision. In the 1969 and 1988 episodes, though, unemployment matters more.

Bringing GATT into the Core

Carsten Kowalczyk and Tomas Sjöström

NBER Working Paper No. 4343

April 1993

JEL Nos. G71, F12, F13, F15

International Trade and Investment

We calculate international transfers of income that lead to a Pareto-optimal trade equilibrium in a world where many countries trade many goods.

Consumer Response to the Timing of Income: Evidence from a Change in Tax Withholding

Matthew D. Shapiro and Joel B. Slemrod

NBER Working Paper No. 4344

April 1993

JEL Nos. H31, E21

Public Economics, Economic Fluctuations

In 1992, the income tax tables were adjusted so that withholding was reduced. A typical worker received an extra \$28.80 in take-home pay per month from March through December 1992, to be offset by a lower tax refund in 1993. The change in withholding amounted to 0.5 percent of GDP. President Bush, who proposed this change in his State of the Union Address, intended that

it provide a temporary stimulus to demand. But the policy change involved only the timing of income; under the life-cycle/permanent-income model, it would be predicted to have a negligible effect on consumption and aggregate demand.

We report consumers' responses to the change in withholding, based on a survey taken shortly after it went into effect. Forty-three percent reported spending the extra take-home pay: substantially more than the standard models predict, but substantially less than the 100 percent upon which the policy was predicated. The decision to save the income is not explained by expected income growth. Therefore, while many households' behavior is not fully consistent with the life-cycle/permanent-income model, liquidity constraints do not appear to account for this behavior.

The Political Economy of Immigration Restriction in the United States, 1890 to 1921

Claudia Goldin

NBER Working Paper No. 4345

April 1993

JEL Nos. N31, N41, J38

Development of the American Economy,
Labor Studies

Anti-immigrant forces almost succeeded in passing restrictive legislation in 1897, but their plan ultimately did not materialize for another 20 years. During that time, 17 million Europeans from among the poorest nations came to the United States. This paper explores the economic and political forces that propped the door open for those 20 years, as well as the factors that eventually shut it. Economic downturns and their consequent unemployment almost always brought demands for restriction. The flood of immigrants eventually resulted in large negative effects on the wages of native-born workers. But the political clout of immigrants was strengthened by the reinforcing nature of their flows. Cities with large numbers of the foreign born received a disproportionate share of immigrants from 1900 to 1910. After 1910, however, immigrant flows were diluting. This factor, and the negative impact of immigrants on native wages, were important in the passage of restrictionist legislation, although the rural heartland of America was pro-restriction from the 1890s.

Do Hostile Takeovers Reduce Extramarginal Wage Payments?

**Jagadeesh Gokhale, Erica Groshen,
and David Neumark**

NBER Working Paper No. 4346

April 1993

JEL Nos. D20, J30, L20

Labor Studies

Hostile takeovers may reduce the prevalence of long-term employment contracts if they facilitate the opportunistic expropriation of extramarginal wage payments.

Our tests of two versions of the expropriation hypothesis improve on existing research by using firm- and establishment-level data from an employer salary survey, and by performing both ex ante and ex post tests.

First, we study the relationship between proxies for extramarginal wage payments and subsequent hostile takeover activity, and find little evidence of an expropriation motive. Then, since we observe wage and employment structures both before and after takeovers, we investigate whether proxies for extramarginal wages drop after hostile takeovers. The ex post experiments provide evidence consistent with one version of the expropriation hypothesis. In particular, such takeovers appear to reduce extramarginal wage payments to more tenured workers, mostly through flattening wage-seniority profiles in firms with relatively senior work forces.

A Model of Target Changes and the Term Structure of Interest Rates

**Giuseppe Bertola, Pierluigi Balduzzi,
and Silverio Foresi**

NBER Working Paper No. 4347

April 1993

JEL Nos. E43, E44

Asset Pricing, Monetary Economics

We explore the effects of official targeting policy on the term structure of nominal interest rates, adapting relevant insights from theoretical work on "peso problems" to explain realistic infrequency of target changes. Our analysis of daily U.S. interest rates and newly available historical targets interprets persistent spreads between short-term money market rates and overnight Fed funds targets, and the poor performance of expectations hypothesis tests: the policy-induced component of Fed funds dynamics appears to be anticipated erroneously by the market. Still, some features of the interest rate targeting process seem to be incorporated by market expectations.

A Note on the New Minimum Wage Research

Janet Currie and Bruce Fallick

NBER Working Paper No. 4348

April 1993

JEL No. J38

Labor Studies

Using panel data from the National Longitudinal Survey of Youth, we find that employed individuals who were affected by the increases in the federal minimum wage in 1979 and 1980 were 3 to 4 percent less likely to be employed a year later. This is true even after we account for the fact that workers employed at the minimum wage may differ from their peers in unobserved ways. Our methodology is similar in spirit to Card's recent work on the topic, but we use individual rather than state-level data, and consider an earlier time period.

International Comparisons of Educational Attainment

Robert J. Barro and Jong-Wha Lee

NBER Working Paper No. 4349

April 1993

JEL Nos. O4, I2

Growth

Many theories of economic growth stress the role of human capital in the form of education, but empirical studies have been hampered by inadequate data. We describe a dataset on educational attainment that we constructed for 129 countries over five-year periods from 1960–85. We use Census/survey information to fill over 40 percent of the cells, and school enrollment figures to fill the remainder. The data refer to male and female attainment among adults at four levels: no schooling, primary, secondary, and higher. We also provide a rough breakdown into incomplete and complete attainment at the three levels of schooling. We then take account of cross-country variations in the durations of schooling at each level to provide figures on total years of attainment.

On the Feasibility of a One- or Multi-Speed European Monetary Union

Alberto Alesina and Vittorio U. Grilli

NBER Working Paper No. 4350

April 1993

International Finance and Macroeconomics

This paper addresses two questions: 1) is a 12-country monetary union in Europe feasible; and 2) can monetary union be achieved with one group of countries going first, and later admitting the others? After examining several politico-economic arguments concerning problems of feasibility of the union, we conclude with a fair amount of skepticism concerning the second, multi-speed idea. We show that the final result of the process of monetary integration is dependent upon at "how many speeds" Europe will proceed. Our discussion of feasibility sheds some light on the political economy of the recent (fall 1992) turmoil in the monetary system of Europe.

The Political Economy of Controls: Complexity

Anne O. Krueger and Roderick Duncan

NBER Working Paper No. 4351

April 1993

JEL No. F13

International Finance and Macroeconomics,
International Trade and Investment

Increasing complexity of regulation over time is a regular empirical phenomenon whenever political processes attempt to control economic activity. In this paper, we argue that a tendency toward increasing complexity of

controls is probably inherent in most efforts to regulate, and that the great likelihood that it will occur should be taken into account in initial policy formulation. Economic policy analyses may be correct as formulated on the assumption that the initial policies will be adopted and not be altered, but wrong if it is recognized that increased complexity may be an inevitable cost of the policy.

Free Trade Agreements as Protectionist Devices: Rules of Origin

Anne O. Krueger

NBER Working Paper No. 4352

April 1993

JEL No. F13

International Trade and Investment

In this paper I argue that there is an important protectionist bias inherent in free trade agreements that is not present in customs unions. In any customs union or free trade agreement, one of the critical issues concerns "rules of origin." In a free trade agreement, rules of origin have an important function because, without such rules, each imported commodity would enter through the country with the lowest tariff on each commodity. The criterion for duty-free treatment is important in determining the economic effects of the rule of origin. I show that rules of origin in fact extend the protection accorded by each country to producers in other member countries of the free trade agreement. As such, rules of origin can constitute a source of bias toward economic inefficiency in free trade agreements in a way they cannot with customs unions.

The Political Economy of Capital Controls

Alberto Alesina, Vittorio U. Grilli,

and Gian Maria Milesi-Feretti

NBER Working Paper No. 4353

May 1993

International Finance and Macroeconomics

This paper studies the institutional and political determinants of capital controls in a sample of 20 OECD countries from 1950–89. One of the most interesting results is that capital controls are more likely to be imposed by strong governments with a relatively "free" hand over monetary policy, because their central banks are not very independent. By imposing capital controls, these governments raise more seigniorage revenue and keep interest rates artificially low. As a result, public debt accumulates at a slower rate than otherwise. This suggests that any institutional reform that makes the central bank more independent makes it more difficult for the government to finance its budget. Tightening the fiscal constraint may force the government to adjust toward a more sound fiscal policy. We also find that capital controls are more likely to be introduced when the exchange rate is pegged or managed. However, we find that capital controls have no effect on growth: we reject rather strongly the hypothesis that capital controls reduce growth.

Economic Growth and Decline with Endogenous Property Rights

Aaron Tornell

NBER Working Paper No. 4354

May 1993

JEL Nos. D9, O4, C73

Growth

This paper introduces endogenous property rights into a neoclassical growth model. I identify a mechanism that generates growth rates that increase at low levels of capital and decrease at high levels of capital. The driving force behind changes in property rights is the attempt of each rent-seeking group to secure exclusive access to a greater share of capital by excluding others. An equilibrium occurs when there is a shift from common to private property, followed by a switch back to common property.

Currency Hedging Over Long Horizons

Kenneth A. Froot

NBER Working Paper No. 4355

May 1993

International Finance and Macroeconomics,

International Trade and Investment, Asset Pricing

This paper reexamines the widely held wisdom that the currency exposure of international investments should be entirely hedged. I find that, as previously documented, hedges do reduce the variance of portfolio returns at short, but not at long horizons. At horizons of several years, complete hedging actually increases the variance of returns of many portfolios. Hedge ratios chosen to minimize long-run return variance not only are low, but also have no perceptible impact on return variance.

Do Historically Black Institutions of Higher Education Confer Unique Advantages on Black Students? An Initial Analysis

Ronald G. Ehrenberg and Donna S. Rothstein

NBER Working Paper No. 4356

May 1993

Labor Studies

Our paper consists of two separate analyses that begin to address this issue. The first uses data from the National Longitudinal Study of the High School Class of 1972 to ascertain whether black college students who attended historically black institutions (HBIs) in the early 1970s had higher graduation rates, better early career labor market success, and higher probabilities of going on to graduate or professional schools than their counterparts who attended other institutions. We control for the characteristics of the students and the institutions, and for the process by which black students decided to enroll (or were prevented from enrolling) in different types of institutions. We find that attendance at an HBI substantially enhanced the probability that a black student received a bachelor's degree within seven years, but had no apparent effect on the student's early labor market success or on the probability of enrolling in post-college schooling.

Then, we use data from the 1987 to 1991 waves of the National Research Council's Survey of Earned Doctorates on the patterns of doctorates conferred to blacks with respect to their undergraduate and graduate institutions, and whether they achieved academic positions in major American liberal arts and research/doctorate institutions. We find that black doctorates who received their undergraduate degrees at HBIs were much less likely to have received their graduate degree at a major research institution than those who attended a major research or selective liberal arts institution as undergraduates. Similarly, among the black doctorates who entered academic careers, those with graduate degrees from HBIs were less likely to be employed in major American research or liberal arts institutions than those who received their graduate degrees from major research institutions.

Equilibrium Unemployment as a Worker Screening Device

Barry Nalebuff, Andrés Rodríguez,

and Joseph E. Stiglitz

NBER Working Paper No. 4357

May 1993

Labor Studies, Economic Fluctuations

We present a model of the labor market with asymmetric information in which equilibrium generates unemployment and job queues, so wages may serve as an effective screening device. This happens because more productive workers—within any group of individuals with a given set of observable characteristics—are more willing to accept the risk of being unemployed than less productive workers are. The model is consistent with cyclical movements in average real wages, as well as with differences in unemployment rates across different groups in the population. We also show that the market equilibrium, in general, is not constrained Pareto efficient. We extend the analysis to incorporate the possibility of renegotiation, and we present a version of the model in which firms enter sequentially. We show that there is *no* advantage of being late, provided that workers have rational expectations.

Rents, Regulation, and Indirect Tax Design

Carlo Perroni and John Whalley

NBER Working Paper No. 4358

May 1993

Public Economics

This paper discusses the implications of rents and regulations that support them for the design of indirect taxes, such as value-added taxes. Intuition suggests high tax rates on industries or products with rents; we argue that whether rents are natural (as a result of fixed factors) or related to market structure (monopolistic) makes a large difference. In the latter case, a high tax may induce adverse behavioral changes. We develop a general equilibrium tax model, based on Canadian data, incorporating both types of rent, and then explore the

implications of different types of rents for the design of indirect taxes. We find that the ways in which taxes deviate from uniformity depend crucially on the mechanisms that generate rents. A broadly based uniform tax typically will not be the optimal choice for economies where rents represent a significant share of value added, even when preferences are homothetic. Finally, the presence of rents substantially affects measures of the social costs of indirect taxes, both in total and at the margin, and in both directions, depending upon the nature of the rents involved.

Illicit Drug Use and Health: Analysis and Projections of New York City Birth Outcomes Using a Kalman Filter Model

H. Naci Mocan and Kudret Topyan

NBER Working Paper No. 4359

May 1993

JEL No. I12

Health Economics

Using monthly data from New York City for 1978–90, we investigate the relationship between drug use during pregnancy and low birthweight. Our results indicate that the increase in pregnancies complicated by drug use accounts for 71 percent of the increase in the rate of black low-birthweight births between 1983–4 and 1990. If drug use among pregnant black women is reduced to its 1978 level, the number of black low-birthweight babies will fall by 8 percent (40 births per month) relative to the level that would have occurred without any intervention. This implies an annual saving (in 1990 dollars) of \$5.1 to \$6.8 million in terms of avoided initial hospitalization and special education costs. However, we could not find a significant relationship between drug use and the rate of low birthweight for whites.

Contrarian Investment, Extrapolation, and Risk

Josef Lakonishok, Andrei Shleifer, and Rob W. Vishny

NBER Working Paper No. 4360

May 1993

Asset Pricing

For many years, stock market analysts have argued that value strategies outperform the market. These value strategies call for buying stocks that have low prices relative to earnings, dividends, book assets, or other measures of fundamental value. While there is some agreement that value strategies produce higher returns, the interpretation of why they do so is more controversial. This paper shows that value strategies yield higher returns because they exploit the mistakes of the typical investor and not because they are fundamentally riskier.

The Endogeneity of Exchange Rate Regimes

Barry Eichengreen

NBER Working Paper No. 4361

May 1993

International Finance and Macroeconomics

The international monetary system has passed through a succession of phases alternatively characterized by the dominance of fixed and flexible exchange rates. How are these repeated shifts between fixed and flexible rate regimes to be understood? This paper specifies and tests six hypotheses capable of explaining the alternating phases of fixed and flexible exchange rates of the last century. The evidence supports a number of the hypotheses considered. In this sense, it confirms that single explanations are not likely to provide an adequate account of the endogeneity of exchange rate regimes

Public Debt in the United States: How Much, How Bad, and Who Pays?

Willem H. Buiter

NBER Working Paper No. 4362

May 1993

JEL Nos. E31, E41, E63, E62, E65, H11

Economic Fluctuations

The United States is in the middle of the pack of industrial countries in terms of the public debt–GDP and public deficit–GDP ratios. The period since 1980 is the only peacetime period other than the Great Depression to see a sustained increase in the debt–GDP ratio. The budgetary retrenchment planned by the Clinton administration is not likely to prove sufficient to achieve a sustainable path, although the remaining permanent primary (noninterest) gap is small: between 0.1 percent and 1.0 percent of GDP. The maximal amount of seigniorage revenue that can be extracted at a constant rate of inflation is not far from the recent historical value of less than 0.5 percent of GDP.

Subtracting net public sector investment from the conventional budget deficit is likely to overstate the government revenue-producing potential of public sector investment. Public debt matters when markets are incomplete, and/or lump-sum taxes are restricted. Future interest payments associated with the public debt are not equivalent to currently expected future transfer payments. Even ignoring the distortionary character of most real world taxes and transfers, and holding constant the government's exhaustive spending program, the "generational accounts" therefore are not a sufficient statistic for the effect on aggregate consumption of the government's tax-transfer program.

Solving the immediate budgetary problems still leaves the much more serious macroeconomic problems of an undersized U.S. federal government sector and an inadequate U.S. national saving rate.

Start-Up Costs and Pecuniary Externalities as Barriers to Economic Development

Antonio Ciccone and Kiminori Matsuyama

NBER Working Paper No. 4363

May 1993

JEL Nos. L16, O11

Growth

One critical aspect of economic development is that productivity growth and a rising standard of living are realized through more roundabout methods of production, and through increasing specialization of intermediate inputs and producer services. We show that an economy that inherits a small range of specialized inputs can be trapped into a lower stage of development. The limited availability of specialized inputs forces the final goods producers to use a labor-intensive technology, which in turn implies a small inducement to introduce new intermediate products. The start-up costs, which make the intermediate goods producers subject to dynamic increasing returns, and pecuniary externalities that result from the factor substitution in the final goods sector, play essential roles.

Multilateral Tariff Corporation During the Formation of Regional Free Trade Areas

Kyle Bagwell and Robert W. Staiger

NBER Working Paper No. 4364

May 1993

JEL Nos. F13, F15

International Trade and Investment

We explore the way that regional free trade agreements affect countries' ability to maintain low cooperative multilateral tariffs. We assume that countries cannot make binding international commitments, but instead are limited to self-enforcing arrangements. Specifically, cooperation in multilateral trade policy involves a constant balance between, on the one hand, the gains from deviating unilaterally from an agreed-upon trade policy and, on the other, the discounted expected future benefits of maintaining multilateral cooperation. The latter would be forfeited in the trade war that followed a unilateral defection in pursuit of the former.

We then explore how regional free trade agreements upset the balance between current and future conditions, and trace these effects' ramifications for multilateral cooperation. Our results suggest that the emergence of regional free trade areas will be accompanied by a temporary retreat from liberal multilateral trade policies. Eventually, however, as the full impact of the emerging free trade agreement on multilateral trade patterns is felt, the initial balance between current and expected future conditions tends to reemerge, and liberal multilateral trade policies can be restored.

Wage Dispersion, Returns to Skill, and Black-White Wage Differentials

David Card and Thomas Lemieux

NBER Working Paper No. 4365

May 1993

JEL Nos. J31, J71

Labor Studies

During the 1980s, wage differentials between younger and older workers and between more- and less-educated workers expanded rapidly. Wage dispersion among individuals with the same age and education also rose. A simple explanation for both sets of facts is that earnings represent a return to a one-dimensional index of skill, and that the rate of return to skill rose over the decade.

We explore a simple method for estimating and testing "single-index" models of wages. Our approach integrates three dimensions of skill: age, education, and unobserved ability. We find that a one-dimensional skill model gives a relatively successful account of changes in the structure of wages for white men and women between 1979 and 1989. We then use the estimated models for whites to analyze recent changes in the relative wages of black men and women.

Resource Allocation During the Transition to a Market Economy: Policy Implications of Supply Bottlenecks and Adjustment Costs

Joshua Aizenman and Peter Isard

NBER Working Paper No. 4366

May 1993

JEL Nos. F36, F43

International Trade and Investment

This paper explains why a laissez-faire approach may fail to account for externalities associated with supply bottlenecks and adjustment costs in transforming economies. Bottlenecks tend to arise whenever input requirements are stochastic and the opportunity cost of holding inventories is high. They are likely to become prevalent in the state industrial sector once budget constraints are hardened and credit markets begin to function properly, since the creditworthiness of state enterprises is limited by outdated production technologies. Our analysis recognizes that producers have incentives to form pooling arrangements, potentially supported by market mechanisms, for reallocating stocks of critical inputs. We show, however, that such arrangements do not eliminate the externalities, and that the externalities rise in a nonlinear manner with the opportunity cost of holding inventories. The analysis suggests that once budget constraints are hardened, the externalities associated with bottlenecks and adjustment costs provide a case for subsidizing the costs of critical inputs for the state industrial sector, but not for the new private sector. This subsidy declines as the private sector grows.

Macroeconomics After Two Decades of Rational Expectations

Bennett T. McCallum

NBER Working Paper No. 4367

May 1993

JEL Nos. E32, O40

Economic Fluctuations, Monetary Economics

This paper describes major developments of the second decade of rational-expectations macroeconomics, roughly 1982 to 1991. The topics that attracted the most attention from researchers were different from those of 1972 to 1981, with considerable emphasis on technical matters. Here, the discussion focuses on four prominent areas: real business cycle analysis; growth theory and its empirical application; issues involving unit roots in macroeconomic time series; and sticky-price models of aggregate supply. The paper concludes by arguing that the current state of knowledge in macroeconomics is not as bad as is often suggested.

Unit Roots in Macroeconomic Time Series: Some Critical Issues

Bennett T. McCallum

NBER Working Paper No. 4368

May 1993

JEL Nos. C22, E32

Economic Fluctuations, Monetary Economics

This paper suggests that the relevant question concerning "unit roots" in the time series of U.S. real GNP is the relative importance of difference-stationary versus trend-stationary components. Various analytical approaches indicate that an accurate answer cannot be obtained with existing data. The paper then considers whether trending series should be differenced prior to use in regression analysis, and suggests that it may not matter greatly if autocorrelated residuals are avoided. Finally, I argue that the absence of cointegration among variables does not imply the absence of any practically useful long-run relationship.

Myopic Loss Aversion and the Equity Premium Puzzle

Shlomo Benartzi and Richard H. Thaler

NBER Working Paper No. 4369

May 1993

Asset Pricing

The equity premium puzzle, first documented by Mehra and Prescott, refers to the fact that stocks greatly outperformed bonds over the last century. As Mehra and Prescott point out, the level of risk aversion necessary to justify the equity premium is implausibly large. But we offer a new explanation of the premium based on Kahneman and Tversky's "prospect theory." First, investors are "loss averse," that is, they are distinctly more sensitive to losses than to gains. Second, investors evaluate their portfolios frequently, even if they have long-term investment goals, such as saving for retirement or manag-

ing a pension plan. We dub this combination "myopic loss aversion." We find that the size of the equity premium is consistent with the previously estimated parameters of prospect theory if investors evaluate their portfolios annually. That is, investors appear to choose portfolios *as if* they were operating with a time horizon of about one year. We then use the same approach to study the size effect and find that myopic loss aversion also may have some explanatory power for this anomaly.

How High Are the Giants' Shoulders? An Empirical Assessment of Knowledge Spillovers and Creative Destruction in a Model of Economic Growth

Ricardo J. Caballero and Adam B. Jaffe

NBER Working Paper No. 4370

May 1993

JEL No. O40

Productivity, Growth, Economic Fluctuations

The pace of industrial innovation and growth is shaped by many forces that interact in complicated ways. Profit-maximizing firms pursue new ideas to obtain market power, but the pursuit of the same goal by others means that even successful inventions eventually are superseded by others; this is known as *creative destruction*. New ideas not only yield new goods but also enrich society's stock of knowledge and its potential to produce new ideas. To a great extent, this knowledge is nonexcludable, so research and inventions are the source of powerful spillovers. The extent of spillovers depends on the rate at which new ideas outdate old ones, or the endogenous technological *obsolescence* of ideas, and on the rate at which knowledge *diffuses* among inventors.

We build a simple model and use data on patents and patent citations as empirical counterparts of new ideas and knowledge spillovers. We estimate the annual rate of creative destruction in the range of 2 to 7 percent for the 1970s, with rates for individual sectors as high as 25 percent. For technological obsolescence, we find an increase over the century from about 3 percent per year to about 12 percent per year in 1990, with a noticeable plateau in the 1970s. We find the rate of diffusion of knowledge to be quite rapid, with the mean lag between one and two years. Finally, we find that the potency of spillovers from old ideas to the generation of new knowledge (as evidenced by the patent citation rate) has been declining over the century; the resulting decline in the effective public stock of knowledge available to new inventors is quite consistent with the observed decline in the average private productivity of research inputs.

A Comparison of Formal and Informal Dispute Resolution in Medical Malpractice

Henry S. Farber and Michelle J. White

NBER Working Paper No. 4371

May 1993

JEL No. K40

Labor Studies, Health Care

We examine the experience of a single large hospital

with an informal prelitigation "complaint" process that resolves some cases outside of the legal system. The results generally are consistent with patients being poorly informed about the quality of medical care and the hospital not knowing whether particular patients are litigious or not. The complaint process seems to resolve many complaints in a less costly manner than filing lawsuits. Almost half of all complaints are resolved before a lawsuit is filed. The large majority of these are dropped, and they are cases that likely would have been dropped even if they had been initiated as lawsuits. Very few cases are settled with a cash payment to patients before a lawsuit is filed, suggesting that patients must file lawsuits in order to convince the hospital that they are litigious enough to justify a settlement. Cases initiated through the complaint process are not resolved (dropped, settled, tried to a verdict) significantly differently from cases initiated as lawsuits. When settlements of lawsuits occur, the amounts paid do not vary depending on how the case originated. But settlements of complaints are much higher for cases settled after a lawsuit is filed. We conclude that the complaint process is a cost-effective "front end" for the litigation process that provides information to patients regarding the quality of their medical care and, hence, the likelihood of negligence.

Corruption

Andrei Shleifer and Rob W. Vishny

NBER Working Paper No. 4372

May 1993

Growth, Public Economics

We present two propositions about corruption: first, the structure of government institutions and the political process are very important determinants of the level of corruption. In particular, weak governments that do not control their agencies lead to ultra-high levels of corruption. Second, the illegality of corruption and the need for secrecy make it much more distortionary and costly than its sister activity: taxation. These results may explain why in some less developed countries, corruption is so high and so costly to development.

Prices and Trading Volume in the Housing Market: A Model with Down Payment Effects

Jeremy C. Stein

NBER Working Paper No. 4373

May 1993

Asset Pricing

This paper presents a simple model of trade in the housing market; the crucial feature is that a minimum down payment is required for the purchase of a new home. The model has direct implications for the volatility of house prices, as well as for the correlation between prices and trading volume. The model also can be extended to address the correlation between prices and time-to-sale, as well as to certain aspects of the cyclical behavior of housing starts.

Garbage, Recycling, and Illicit Burning or Dumping

Don Fullerton and Thomas C. Kinnaman

NBER Working Paper No. 4374

May 1993

JEL Nos. H23, H42, H71, Q2

Public Economics

Solid waste disposal imposes resource and environmental costs, but most residents still are not charged by the marginal unit of garbage collection. If garbage and recycling are the only two disposal options, then the optimizing fee for garbage collection equals the resource cost plus the environmental cost.

If illicit burning or dumping is a third disposal option, however, then the optimizing fee for garbage collection can change. Burning or dumping is not a market activity and cannot be taxed directly. It can be discouraged, though, by a tax on all output plus a rebate on proper disposal, either through recycling or garbage collection. This optimizing fee structure is essentially a deposit-refund system. The output tax helps to achieve the first-best allocation, even though it may affect the choice between consumption and untaxed leisure, since consumption leads to disposal problems while leisure does not.

State Responses to Fiscal Crises:

The Effects of Budgetary

Institutions and Politics

James M. Poterba

NBER Working Paper No. 4375

May 1993

JEL Nos. H72, H71

Public Economics

How do state fiscal institutions and political circumstances affect the dynamics of state taxes and spending during periods of fiscal stress? This analysis focuses on the late 1980s, when sharp economic downturns in several regions, coupled with increased demands for expenditure, led to substantial state budget deficits. "No deficit carryover" rules, and tax and expenditure limitations, have real effects on the speed and nature of fiscal adjustment to unexpected deficits. Political factors also are important. When a single party controls the state legislature and the governorship, the reaction to state deficits is much faster than when party control is divided. In gubernatorial election years, both tax increases and spending cuts are significantly smaller than at other times.

Tobin's Q , Corporate Diversification, and Firm Performance

Larry H. P. Lang and René M. Stulz

NBER Working Paper No. 4376

June 1993

Corporate Finance

We show that Tobin's q and firm diversification are negatively related, even with different measures of verifi-

cation and after controlling for other known determinants of q . Further, diversified firms have lower q 's than equivalent portfolios of specialized firms. This negative relationship holds throughout the 1980s in our sample. It also holds for firms that have kept their number of segments constant over a number of years, as well as for firms that have not. In our sample, firms that increase their number of segments have lower q 's than firms that keep their number of segments constant. Firms appear to seek growth through diversification when they have exhausted internal growth opportunities. But diversification does not provide firms with a valuable intangible asset.

Are Foreign Exchange Intervention and Monetary Policy Related and Does It Really Matter?

Karen K. Lewis

NBER Working Paper No. 4377

June 1993

International Finance and Macroeconomics,
Monetary Economics

The relationship between foreign exchange intervention and monetary policy underlies the question of whether sterilized interventions can affect the exchange rate. I examine this relationship using data on U.S. foreign exchange interventions from 1985 to 1990. I ask whether interventions can be viewed as "signaling" changes in future monetary policy. I also consider whether changes in monetary policy may induce interventions as a way to "lean against the wind" of exchange rate movements. I find both that interventions help predict monetary policy and that monetary variables help predict interventions. I also study the response of exchange rates to shocks in various monetary policy variables.

Investment in Manufacturing, Exchange Rates, and External Exposure

Jose Campa and Linda S. Goldberg

NBER Working Paper No. 4378

June 1993

International Trade and Investment,
International Finance and Macroeconomics

We study the link between exchange rates and investment, emphasizing the role of producer exposure through export sales and through imported inputs into production, in two-digit U.S. manufacturing sectors. On average, manufacturing sectors have evolved from being primarily export exposed in the 1970s to being primarily import exposed by the early 1980s. Because of this pattern in exposure, exchange rate appreciations reduced investment in durable goods sectors in the 1970s and stimulated investment after 1983. By contrast, nondurable sectors tended to absorb exchange rate changes in price-over-cost markups. Exchange rate volatility depressed investment, but the effects were small.

Common Development of Institutional Change as Measured by Income Velocity: A Century of Evidence

from Industrialized Countries

Michael D. Bordo, Lars Jonung, and Pierre L. Siklos

NBER Working Paper No. 4379

June 1993

JEL No. E41

Monetary Economics

Previous evidence, most recently by Bordo and Jonung (1990) and Siklos (1988, 1991), has shown on a country-by-country basis that proxies for institutional change significantly improve our understanding of the long-run behavior of velocity and, consequently, of the demand for money. If institutional change is a common development across industrialized countries, it should have a common influence on velocity; the same need not be true for the other principal determinants of velocity, such as income and interest rates. This implies that the process of institutional change should be cointegrated across countries, but the determinants of conventional velocity need not be.

This study extends the existing evidence to common features in velocity, income, and interest rates across Canada, the United States, the United Kingdom, Norway, and Sweden. We rely on a sample of annual observations from 1870 on.

The evidence supports a unique long-run relationship in velocity, but not in income and interest rates; the common feature in velocity is more apparent after, rather than before, World War II. However, before World War II, common features in velocity are more apparent for the United States and Canada, and separately, for Norway and Sweden. Finally, we find that only a model that includes proxies for institutional change possesses a single trend in the pooled time series, as well as long-run elasticities consistent with theoretical predictions. We argue that the evidence can be understood only in the context of common historical developments in the respective countries' financial systems.

Economic Stability and Aggregate Investment

Robert S. Pindyck and Andrés Solimano

NBER Working Paper No. 4380

June 1993

JEL Nos. E22, D92, E61

Economic Fluctuations, Growth

The recent literature suggests that, because investment expenditures are irreversible and can be delayed, they may be highly sensitive to uncertainty. We briefly summarize the theory, stressing its empirical implications. We then use cross-section and time-series data for a set of developing and industrialized countries to explore the relevance of the theory for aggregate investment. We find that the volatility of the marginal profitability of capital—a summary measure of uncertainty—affects investment as the theory suggests, but that the

size of the effect is moderate, and is greatest for developing countries. We also find that this volatility has little correlation with indexes of political instability used in recent studies of growth, as well as several indexes of economic instability. Only inflation is highly correlated with this volatility, and is also a robust explanator of investment.

Efficiency and Equality in a Simple Model of Efficient Unemployment Insurance

Andrew Atkeson and Robert E. Lucas, Jr.

NBER Working Paper No. 4381

June 1993

Economic Fluctuations

This paper describes the efficient allocation of consumption and work in an economy in which workers face idiosyncratic employment risk, and moral hazard prevents full insurance. We impose a lower bound on the expected discounted utility that can be assigned to any agent from any date onward and show, with this feature added, that the efficient unemployment insurance scheme induces an invariant cross-sectional distribution of individual entitlements to utility. Thus we provide a simple prototype model suited to the study of the question: What is the trade-off between equality and efficiency in resource allocation?

Efficiency of the Tokyo Housing Market

Takatoshi Ito and Keiko Nosse Hirono

NBER Working Paper No. 4382

June 1993

JEL Nos. G00, H20, R14

Miscellaneous

To analyze the dynamics of Tokyo housing prices, we have compiled annual microdatasets from individual listings in a widely circulated real estate advertising magazine. One dataset compiled from "properties for investment" lists both asking (sales) prices and rents for the same properties. With such data, we can calculate a price-rent ratio, and we find that expected capital gains, before tax and commissions, are just under 90 percent in ten years.

The dataset of "repeatedly listed properties for investment," a subset of the first, contains only those units for sale in the same buildings after a one-year interval. In this dataset, we can calculate price, rent, and ex post capital gains. We show that ex post returns on housing investment in the last four years were actually rather modest.

The datasets for "housing for sale" and "housing for rent" were used separately in constructing hedonic price and rent indexes. According to our estimates, in the last 11 years in Tokyo, prices increased 85–90 percent, while rents increased about 65 percent. The price–(annual) rent ratio appears to have fluctuated between 17 and 32 from 1981–92.

Timing Is All: Elections and the Duration of U.S. Business Cycles

Michael W. Klein

NBER Working Paper No. 4383

June 1993

JEL No. E3

Economic Fluctuations

Political theories of the business cycle predict that the occurrence and outcome of elections affect the timing of turning points. Opportunistic political theory of the business cycle predicts that a contraction is more likely to end soon after an election than at other times. Rational partisan political theory of the business cycle predicts differences in the likelihood of the end of an expansion after an election depending upon the party of the newly elected president. I directly test the effect of elections on the turning points in the U.S. business cycle. I do not find that a contraction is more likely to end in the period before an election than in other periods. However, there is significant evidence that an expansion is more likely to end after the election of a Republican president than after the election of a Democratic president, both after World War I and after World War II.

Did the Thatcher Reforms Change British Labor Performance?

David G. Blanchflower and Richard B. Freeman

NBER Working Paper No. 4384

June 1993

Labor Studies

This paper evaluates the success of policies implemented in the 1980s to improve the workings of the U.K. labor market. Our primary conclusion is that the Thatcherite reforms succeeded in weakening union power. They also may have increased employment marginally and made wages more responsive to market conditions, and they may have increased self employment. The reforms were accompanied by a substantial improvement in the labor market position of women. But they failed to improve the responsiveness of real wages to unemployment. They also were associated with a slower transition from nonemployment to employment for men; a devastating loss in full-time jobs for male workers; and they produced substantial increases in earnings inequality.

Effects of Alcohol Price Policy on Youth

Michael Grossman, Frank J. Chaloupka,

Henry Saffer, and Adit Laixuthai

NBER Working Paper No. 4385

June 1993

JEL No. I18

Health Economics, Public Economics

We summarize research on how alcoholic beverage prices and excise taxes affect alcohol consumption, excessive consumption, motor vehicle accident mortality, and college completion rates among the young. The research uses six nationally representative datasets on individuals that span 1974 through 1989, and two state-

level datasets for 1975–81 and 1982–8. The studies find that alcohol use and motor vehicle accident mortality are related negatively to the cost of alcohol. College completion rates are related positively to the cost of alcohol. Clearly, these findings are policy relevant, since price can be changed. Frequently, the effects of a variety of simulated hikes in the excise tax are larger than the effects of raising the uniform minimum legal drinking age to 21 in all states.

The Allocation of Time: Young Versus Elderly Households in Japan

Tadashi Yamada and Tetsuji Yamada

NBER Working Paper No. 4386

June 1993

JEL No. J22

Labor Studies

We show that household production theory can illuminate the allocation of time and consumption among households. For example, we find that various nonmarket allocations of time (and consequently, market labor supply) cannot be separated from consumption expenditures. An increase in market wage rates for both young and elderly households reduces their time spent on nonmarket activities, including child care, medical care, and listening to the radio and watching TV. The high opportunity costs of waiting at the hospital clearly discourage working people from going to the hospital. These results show many similarities between household nonmarket allocation of time in Japan and in the United States.

Is a Value-Added Tax Progressive?

Annual Versus Lifetime Incidence Measures

Erik Caspersen and Gilbert E. Metcalf

NBER Working Paper No. 4387

June 1993

JEL Nos. H20, H22

Public Economics

We measure the lifetime incidence of a value-added tax (VAT) using income data from the Panel Study of Income Dynamics and consumption data from the Consumer Expenditure Survey. When we use annual income as a measure of economic well-being, a VAT looks quite regressive. However, the results change significantly when we use lifetime income. With two different measures of lifetime income, we find that a VAT in the United States would be proportional to slightly progressive over the lifetime.

Health Insurance Provision and Labor Market Efficiency in the United States and Germany

Douglas Holtz-Eakin

NBER Working Paper No. 4388

June 1993

JEL Nos. D6, H51, I18, J38

Health Care, Labor Studies, Public Economics

Health insurance has claimed a prominent place on the policy agenda in the United States. Critics argue that

the status quo has led to spiraling health care costs and an inequitable distribution of high-quality medical care, and that employer-provided health insurance has “locked” individuals into jobs, thereby interfering with the efficient matching of employers and employees. In contrast to the United States, Germany guarantees virtually all citizens health insurance. Insurance is portable, but the cost may change when an individual changes jobs, again leading to the potential for job-lock. We assess the magnitude of health insurance-related impediments to job mobility in both countries. We find little evidence that the provision of health insurance interferes with job mobility in either country, thus suggesting that employer-based systems for providing health insurance do not alter this aspect of labor market efficiency.

Monopolistic Competition and International Trade: Reconsidering the Evidence

David Hummels and James A. Levinsohn

NBER Working Paper No. 4389

June 1993

JEL No. F1

International Trade and Investment

We investigate whether the volume of trade between OECD countries can be modeled as intraindustry trade in differentiated products. Then we repeat the test with non-OECD countries. We also investigate whether the share of intraindustry trade can be modeled more generally with some, but not all, trade being intraindustry. Our results lead us to question the apparent empirical success of these models.

Does Employment Protection Inhibit Labor Market Flexibility? Lessons from Germany, France, and Belgium

Katharine G. Abraham and Susan N. Houseman

NBER Working Paper No. 4390

June 1993

Labor Studies

In most western European countries, workers by law have strong job rights, including the right to advance notice of layoff, and the right to severance pay or other compensation if laid off. Many of these same countries, by providing prorated unemployment compensation to workers on reduced hours, also encourage hours adjustment in lieu of layoffs.

This paper compares the adjustment of U.S. manufacturing employment and hours to that in Germany, France, and Belgium: three countries with strong job security regulations and well-established short-time compensation systems. Although the adjustment of employment to changes in output is much slower in the German, French, and Belgian manufacturing sectors than in U.S. manufacturing, the adjustment of total hours worked is fairly similar. The short-time system makes a significant contribution to observed adjustment in all three European countries. In addition, there is little evidence

that the weakening of job security regulations that occurred in Germany, France, and Belgium during the 1980s affected employers' adjustment to changes in output.

These findings suggest that, given appropriate supporting institutions, strong job security need not inhibit employer adjustment to changing conditions.

Do 401(k) Contributions Crowd Out Other Personal Saving?

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

NBER Working Paper No. 4391

June 1993

JEL Nos. E21, G23, H31, J14

Aging, Public Economics

During the late 1980s, 401(k) plans eclipsed Individual Retirement Accounts (IRAs) to become the leading form of tax-deferred individual retirement saving. We use data from the 1984, 1987, and 1991 Surveys of Income and Program Participation to describe participation in and contributions to 401(k) plans, and to evaluate the net impact of these contributions on personal saving. We find that, conditional on eligibility, 401(k) participation exceeds 60 percent at all income levels. This contrasts with IRAs in the early 1980s, participation in which rose sharply across income groups.

We study the net effect of 401(k) contributions on personal saving by comparing the growth of non-401(k) assets for contributors and noncontributors, and by comparing the level of wealth for families who are and are not eligible for 401(k)s. We find little evidence that 401(k) contributions substitute for other forms of private saving.

We also explore the substitutability of 401(k) contributions for IRA contributions, and revisit the question of whether IRAs substitute for other types of saving. Our findings suggest little substitution on either margin.

Internal Finance and Firm Investment

**R. Glenn Hubbard, Anil K. Kashyap,
and Toni M. Whited**

NBER Working Paper No. 4392

June 1993

JEL Nos. E22, G31

Corporate Finance

The neoclassical investment model with no financing constraints cannot be rejected for U.S. manufacturing firms with high (presample) dividend payouts. However, it is decisively rejected for firms with low (presample) payouts (firms that we expect will face financing constraints). Investment is sensitive to both firm cash flow and macroeconomic credit conditions, holding investment opportunities constant. Subsamples based on firm size or maturity do not produce such distinctions. Subsample comparisons identify firms in which "free-cash-flow" problems might be expected to produce correlations between investment and cash flow.

Ranking Mutual Funds on an Aftertax Basis

Joel M. Dickson and John B. Shoven

NBER Working Paper No. 4393

July 1993

JEL Nos. E62, G31

Corporate Finance, Public Economics

This paper takes shareholder taxes into account in determining the performance of growth and growth-and-income mutual funds from 1963 to 1992. We rank a sample of funds on a before- and aftertax basis for investors in different income classes with various investment horizons. The differences between the relative ranking of funds are dramatic, especially for middle- and high-income investors. For instance, one fund that ranks in the 19th percentile on a pretax basis ranks in the 61st percentile for an upper-income, taxable investor.

Labor Demand and the Source of Adjustment Costs

Daniel S. Hamermesh

NBER Working Paper No. 4394

July 1993

JEL No. J23

Labor Studies

Most models of dynamic labor demand are written in terms of the costs of adjusting employment (net adjustment costs). A few are based on the costs of hiring and firing (gross adjustment costs). This study derives several models with both types of adjustment costs. A dynamic-programming model with quadratic adjustment costs estimates the lower bound on the fraction of adjustment costs that are gross. A model with lumpy costs of adjustment also estimates the relative sizes of the two types of costs. I estimate the models over two sets of short monthly time series obtained from private sources: one from a medium-size hospital, the other describing three plants operated by a small manufacturing firm. I also estimate the quadratic-cost model using data describing small industries. The estimates demonstrate that the importance of the two types of cost differs across establishments, although gross adjustment costs appear relatively larger. The results provide evidence on issues of asymmetry in business cycles and on the role of human capital in generating externalities in economic growth.

Presidential Leadership and the Reform of Fiscal Policy: Learning from Reagan's Role in TRA 86

Robert P. Inman

NBER Working Paper No. 4395

July 1993

JEL Nos. H11, H21

Public Economics

The institutions of federal fiscal policymaking seem incapable of confronting the central domestic issues of the day. This paper presents a model of congressional deci-

sionmaking in which legislators' incentives are contrary to fiscal efficiency. In such an environment, a "strong" president may be able to lead Congress away from inefficient budgets.

This paper specifies a model of what constitutes a strong president: a president with the resources to build congressional coalitions, and a credible veto to force "all-or-nothing" choices between reform and the inefficient status quo. I detail President Reagan's role in the passage of the Tax Reform Act of 1986 in light of this model. The analysis reveals the role of executive resources, and the importance of the veto strategy to major fiscal reform.

Aggregate Income Risks and Hedging Mechanisms

Robert J. Shiller

NBER Working Paper No. 4396

July 1993

Asset Pricing, Economic Fluctuations

Using time-series data on real gross domestic products, I estimate the variability (standard deviations) of returns in markets for perpetual claims on countries' incomes. The results indicate that this variability is as large as that of returns in stock markets. There may be only a minimal possibility of cross-hedging these returns in existing capital markets.

I then examine various methods of establishing markets for perpetual claims on aggregate incomes. By allowing hedging of these aggregate income risks, such markets might make for dramatically more effective international macroeconomic risk-sharing than is possible today. Retail institutions might develop around such markets and help the public with their risk management. However, the establishment of such markets also would incur the risk of major financial bubbles and panics.

Altered States: Taxes and the Location of Foreign Direct Investment in America

James R. Hines, Jr.

NBER Working Paper No. 4397

July 1993

JEL Nos. H87, H73, H25, F23

Public Economics

This paper examines the effect of taxation on foreign investment and on business location within the United States. The idea is to *compare* the interstate distribution of investments from certain foreign countries (those with foreign tax credit systems) *with* the distribution of investments from other countries. Investors from countries with foreign tax credit systems receive home-country tax credits for income taxes paid to U.S. states, so they are less likely than other investors to avoid high-tax states. The results indicate that 1 percent differences in state corporate tax rates are associated with 7–9 percent differences between the investment shares of foreign tax credit investors and the investment shares of all others. This suggests that state taxes significantly influence the pattern of foreign direct investment in the United States.

Living Arrangements:

Health and Wealth Effects

**Axel Börsch-Supan, Daniel McFadden,
and Reinhold Schnabel**

NBER Working Paper No. 4398

July 1993

JEL Nos. J14, R31

Aging

This paper investigates the choice of living arrangements among elderly Americans. It has two specific aims. First, because health cannot be measured directly and can only be described by indicators, it explores a new approach to modeling the influence of the latent health status on living arrangements. Second, it exploits the NBER Economic Supplement of the Longitudinal Study on Aging to investigate the role of housing and financial wealth in the choice of living arrangements.

Market Share and Exchange Rate

Pass-Through in World Automobile Trade

**Robert C. Feenstra, Joseph E. Gagnon,
and Michael M. Knetter**

NBER Working Paper No. 4399

July 1993

JEL Nos. F12, F14, L13, L62

International Trade and Investment

This paper explores the relationship between exchange rate pass-through and market share for monopolistically competitive exporters. Under fairly general assumptions, we show that pass-through should be high for exporters based in a country with a very large share of total destination market sales. For source countries with small and intermediate market shares, the theoretical relationship is potentially nonlinear and sensitive to assumptions about the nature of consumer demand and firm interactions. We estimate the model using a panel dataset of automobile exports from France, Germany, Sweden, and the United States to a variety of destinations from 1970–88. The empirical relationship between pass-through and market share is significantly nonlinear: pass-through is lowest when the source country's market share is around 45 percent, and is highest when the source country's share approaches 100 percent.

Reputation Formation in Early Bank Debt Markets

Gary Gorton

NBER Working Paper No. 4400

July 1993

JEL Nos. G2, N21

Corporate Finance

This paper tests two hypotheses about firms issuing debt for the first time. The first is that the debt of new firms will be discounted more heavily by lenders than the debt of firms with credit histories (that are otherwise identical). This excess discount declines over time as lenders observe defaults. The declining interest rate cor-

responds to the formation of a "reputation," a valuable asset that provides an incentive for firms to choose projects that are not risky. The second hypothesis is that, prior to the establishment of a reputation, new firms issuing debt are monitored more intensely than established firms.

My sample consists of new banks issuing bank notes for the first time during the America Free Banking Era (1838–60). I confirm the presence of a reputation effect in debt prices: the debt of new banks is discounted more heavily than the debt of banks with credit histories. Noteholders then are motivated to monitor new banks, because the excess discount provides an incentive to redeem the notes of new banks. As lenders learn that new banks can redeem their notes, the discount rate declines, as predicted, for surviving banks. The precision of learning increases during the period because of technological improvements in the transmission of information, namely, the introduction of the telegraph and the railroad. The results explain why the pre-Civil War system of private money issuance by banks was not plagued by problems of overissuance ("wildcat banking").

Measuring the Welfare Effect of Quality Change: Theory and Application to Japanese Autos

Robert C. Feenstra

NBER Working Paper No. 4401

July 1993

International Trade and Investment, Productivity

This paper identifies conditions under which hedonic price indexes measure consumer welfare exactly, so that the welfare effects of quality change can be inferred. The results provide a rationale for existing practices, although the conditions needed to justify those practices are somewhat restrictive. I apply the results to the increase in characteristics of Japanese autos sold in the United States following the imposition of quotas in 1981. I argue that consumers did *not* value the additional characteristics at their former shadow values, but rather at lower values. I then compute the exact index that reflects this lower imputed value, and compare it to the conventional quality adjustment. I find that the dead-weight loss associated with the change in quality is between one-quarter and one-third of the value of upgrading.

Does Public Health Insurance Reduce Labor Market Flexibility or Encourage the Underground Economy? Evidence from Spain and the United States

Sara De La Rica and Thomas Lemieux

NBER Working Paper No. 4402

July 1993

JEL Nos. I1, J3

Labor Studies

This paper compares the labor market implications of the health insurance systems in Spain and the United

States. While most health insurance is provided privately to workers (by employers) in the United States, workers in Spain obtain health insurance coverage from the public social security system. The Spanish system is financed by a payroll (social security) tax shared between employers and employees. However, there is clear evidence of widespread noncompliance with the social security tax.

We compare the incidence of health insurance coverage among U.S. workers to the pattern of compliance with the social security tax among Spanish workers. We find that these two patterns are very similar. They depend on the same supply and demand factors, consistent with basic economic models of private provision of benefits and tax compliance. However, one important difference between the two systems is that in Spain, unlike the United States, essentially all heads of household work in the covered sector and thus have full access to public health care for themselves and their dependents.

Cattle Cycles

Sherwin Rosen, Kevin M. Murphy,

and Jose A. Scheinkman

NBER Working Paper No. 4403

July 1993

Economic Fluctuations, Labor Studies

U.S. stocks of cattle are one of the most periodic time series in economics. We construct a theory of cattle cycles, based upon rational inventory decisions about breeding stock, given the delays in gestation and maturation between production and consumption. The low fertility rates of cows, and the substantial lags between fertility and consumption decisions, cause the demographic structure of the herd to respond cyclically to changes in the demand for beef and in production costs. The known biotechnology of cattle demographics implies sharp numerical benchmarks for the dynamic system that describes the evolution of cattle stocks and beef consumption. These benchmarks compare very closely to structural econometric time-series estimates for 1875 to 1990. This proves that systematic cattle cycles have a wholly rational explanation.

U.S. Commercial Banking: Trends, Cycles, and Policy

John H. Boyd and Mark Gertler

NBER Working Paper No. 4404

July 1993

JEL Nos. E44, G2

Monetary Economics

This paper pinpoints sources of recent problems in U.S. commercial banking in order to provide a context for evaluating policy options. First we document how increased competition and financial innovation made banking less stable in the 1980s. Second, we identify the specific sources of the banking industry's difficulties over this decade. We find that the poor ex post performance by large banks provided the main stress on the

system. From a variety of evidence, we conclude that this poor performance was the product of increased competition for the industry, and of a regulatory system that provides greater subsidies to risktaking by large banks relative to the industry mean. Finally, we analyze recent policy reforms and ongoing policy options, in the light of our evidence on the main sources of problems in banking.

Reassessing the Social Returns to Equipment Investment

**Alan J. Auerbach, Kevin A. Hassett,
and Stephen D. Oliner**

NBER Working Paper No. 4405

July 1993

JEL Nos. H23, E22, O41

Growth, Public Economics

The recent literature on the sources of economic growth has challenged the traditional growth accounting of the Solow model, which assigned a relatively limited role to capital deepening. As part of this literature, De Long and Summers have argued in two papers that the link between equipment investment and economic growth across countries is stronger than what the Solow model generates. Accordingly, they conclude that such investment yields important external benefits.

However, their analysis suffers from two shortcomings. First, De Long and Summers have not conducted any formal statistical tests of the Solow model. Second, even their informal rejection of the model fails to survive reasonable tests of robustness.

We test the predictions of the Solow model formally, using De Long and Summers's data. Our results cast doubt on the existence of externalities to equipment investment. In particular, we find that the empirical link between investment and growth in the OECD countries is fully consistent with the Solow model. Moreover, for De Long and Summers's full sample, the evidence of excess returns to equipment investment is tenuous.

Does Head Start Make a Difference?

Janet Currie and Duncan Thomas

NBER Working Paper No. 4406

July 1993

JEL No. I38

Health Economics, Labor Studies

Although there is broad bipartisan support for Head Start, the evidence of positive long-term effects of the program is not overwhelming. Using data from the National Longitudinal Survey's Child-Mother file, we examine the impact of Head Start on a range of outcomes.

We find that participation in Head Start has positive and persistent effects on the test scores of white and Hispanic children. These children also are less likely to have repeated a grade than nonparticipating children. We find

no effects on the test scores or the schooling attainment of African-American children, though.

White children who attend Head Start also are more likely to receive a measles shot, while African-American enrollees receive measles shots at an earlier age than their peers. African-American children who attend Head Start also are taller than their siblings. Finally, we find that whites who attended Head Start as children are taller and have higher educational test scores than their siblings who did not attend.

Welfare Transfers in Two-Parent Families: Labor Supply and Welfare Participation Under AFDC-UP

Hilary Williamson Hoynes

NBER Working Paper No. 4407

July 1993

JEL No. I38

Public Economics

This paper examines the effect of cash transfers and food stamps on family labor supply and welfare participation among two-parent families. The Aid to Families with Dependent Children-Unemployed Parent (AFDC-UP) program has been providing cash benefits to two-parent households since 1961, and recent congressional action has increased its importance. In my model, the husband and wife can choose no work, part-time work, or full-time work. I find that both labor supply and welfare participation among two-parent families respond quite a bit to changes in the benefit structure under the AFDC-UP program.

Corporate Finance Benefits from Universal Banking: Germany and the United States, 1870-1914

Charles W. Calomiris

NBER Working Paper No. 4408

July 1993

JEL Nos. N2, G2, G3

Corporate Finance,

Development of the American Economy

Limitations on bank consolidation and branching in the United States at an early date effectively limited the scope of commercial banks and their involvement in financing large-scale industry, and increased the information and transaction costs of issuing securities. In contrast, German industry was financed by large-scale universal banks that maintained long-term relationships with firms, involving ongoing monitoring and disciplining of management, and underwriting. The low costs of German industrial finance are reflected in lower investment banking spreads on securities issues, and in a higher propensity to issue equity than in the United States.

The Effect of Low Birthweight on the Health, Behavior, and School Performance of School-Aged Children

Hope Corman and Stephen Chaikind

NBER Working Paper No. 4409

July 1993

JEL Nos. I20, I12

Health Economics

This study uses the 1988 Child Health Supplement of the National Health Interview Survey to examine the performance of school-aged children who were of low birthweight. We consider a number of indicators of school performance, health, and behavior. We look separately at children ages 6 to 10 and children ages 11 to 15. In addition, we study one age group that includes all children, and one that excludes children attending special education programs. We find that low-birthweight children are more likely to perform poorly in school than their normal-birthweight peers, and that they are more likely to experience health problems, even into their adolescence. We do not find significantly more behavior problems for low-birthweight children compared to their normal-birthweight peers, though.

Round-the-Clock Trading: Evidence from U.K. Cross-Listed Securities

Allan W. Kleidon and Ingrid M. Werner

NBER Working Paper No. 4410

July 1993

JEL Nos. F4, F21

International Finance and Macroeconomics

Using transactions data from the London Stock Exchange and more detailed information on a sample of U.K. firms that are cross-listed on the New York Stock Exchange, we compare volatility, volume, and quotes as trading starts in London and then continues in New York. These U.K. firms have substantially longer trading hours than most singly listed stocks, and also are traded in two markets with very different institutional setups. We show that this has several important implications for theories on intraday behavior of prices, the organization of exchanges, and the general consequences of round-the-clock trading.

Social Insurance and Transition

Andrew Atkeson and Patrick J. Kehoe

NBER Working Paper No. 4411

July 1993

Economic Fluctuations

We find that adding social insurance may slow the transition of moving workers from matches in the state sector to new matches in the private sector. When there are incentive problems in this rematching process, the optimal social insurance scheme may involve forced layoffs and involuntary unemployment.

An Exact Solution for the Investment and Market Value of a Firm Facing Uncertainty, Adjustment Costs, and Irreversibility

Andrew B. Abel and Janice C. Eberly

NBER Working Paper No. 4412

July 1993

JEL No. E22

Asset Pricing

We derive closed-form solutions for the investment and market value of competitive firms with constant returns to scale production and convex costs of adjustment under uncertainty. Optimal investment is a nondecreasing function of q , the shadow value of capital. Optimality implies that q cannot contain a bubble; thus, optimal investment depends only on fundamentals. However, the value of the firm may contain a bubble that does not affect investment behavior. The introduction of irreversibility of investment does not affect q , but it reduces the fundamental market value of the firm.

Historical Factors in Long-Run Growth

Added and Discouraged Workers in the Late 1930s: A Reexamination

T. Aldrich Finegan and Robert A. Margo

NBER Historical Paper No. 45

April 1993

JEL No. N32

We revisit the debate between W. S. Woytinsky and Clarence Long over "added" versus "discouraged" workers in the late 1930s. According to Woytinsky, the Depression created large numbers of added workers: persons who entered the labor force when the head of the household became unemployed. On the other hand, Long believed that the number of added workers was trivial compared with the number of discouraged workers. Subsequent research largely has supported Long.

Using data on married women drawn from the public use sample of the 1940 Census, we show that the added worker effect was alive and well in the late 1930s, but that its viability was muted by the operation of work relief: wives whose husbands held "public emergency work relief" jobs with the Works Progress Administration or related agencies were far less likely to participate in the labor force than wives whose husbands were employed in a private sector or nonrelief government job, or whose husbands were unemployed. In fact, the added worker effect disappears in the aggregate if the impact of work relief is ignored.

Land, Labor, and the Wage–Rental Ratio: Factor Price Convergence in the Late Nineteenth Century

**Kevin O'Rourke, Alan M. Taylor,
and Jeffrey G. Williamson**

NBER Historical Paper No. 46

May 1993

This paper augments the new historical literature on factor price convergence. We focus on the late nineteenth century, when economic convergence among the current OECD countries was dramatic. We also concentrate on the convergence between the Old World and the New, by far the biggest participants in global convergence during the period. We look at land and labor, the two most important factors of production in the nineteenth century.

Wage–rental ratios boomed in the Old World and collapsed in the New, moving the resource-rich and labor-scarce New World closer to the resource-scarce and labor-abundant Old World. Convergence was caused by: commodity price convergence and factor price equalization; migration, capital deepening, and frontier disappearance, factors stressed by Malthus, Ricardo, Wicksell, and Viner; and factor-saving biases.

Late-Comers to Mass Emigration: The Latin Experience

Timothy J. Hatton and Jeffrey G. Williamson

NBER Historical Paper No. 47

June 1993

The Latin countries—Italy, Portugal, and Spain—were industrial late-comers and experienced mass emigration only late in the nineteenth century. There is a debate over why they joined the mass migrations late, were poor by western European standards, and why so many of their citizens went to Latin America. We use a late nineteenth century panel dataset (including real wages adjusted by purchasing power parity) for 12 European countries and find that Latin emigration was no different from emigration from northwestern Europe. For example, supplies of Latin emigrant labor were relatively inelastic, contrary to the hypothesis made famous by Sir Arthur Lewis. What made the Latin experience different was the underlying economic and demographic fundamentals driving it.

Mass Migration, Commodity Market Integration, and Real Wage Convergence in the Late-Nineteenth-Century

Atlantic Economy

**Jeffrey G. Williamson, Timothy J. Hatton,
and Kevin O'Rourke**

NBER Historical Paper No. 48

June 1993

Growth

Continuing a process that began in 1850, real wages

among countries now in the OECD converged during the late 19th century. The convergence was as pronounced as what we have seen since World War II. To isolate the sources of that economic convergence, we assess the relative performance of the two most important economies in the Old World and the New: Britain and the United States.

It turns out that, between 1870 and 1910, what mattered for real wage convergence were commodity price convergence and mass migration. During this same period, *offsetting* forces were contributing to late-19th-century *divergence*, which is consistent with economic historians' traditional attention to Britain's alleged failure and America's spectacular rise to industrial supremacy. However, the convergence forces dominated for most of the period.

Vertical Restraints in the Bromine Cartel: The Role of Distributors in Facilitating Collusion

Margaret Levenstein

NBER Historical Paper No. 49

July 1993

JEL Nos. L13, N61

Industrial Organization

From 1885 to 1902, manufacturers and distributors in the American bromine industry cooperated to increase prices and profits. Like many sectors of the American economy at the time, the bromine industry was made up of a large number of small manufacturers and a small number of national distributors. The manufacturers agreed to pool their output and to sell only to two distributors. The distributors accumulated excess inventories rather than let the market price fall, but then they used those inventories as a threat to deter cheating and new entry. Participants in the industry designed contracts to balance fluctuations in the costs and benefits of cheating. These contracts succeeded in stabilizing collusion until the entry of new, vertically integrated, mass production firms led to its demise.

Technical Papers

Bayesian Inference and Portfolio Efficiency

**Shmuel Kandel, Robert McCulloch,
and Robert F. Stambaugh**

NBER Technical Paper No. 134

May 1993

JEL Nos. C11, G12, G11

Asset Pricing

We use a Bayesian approach to investigate information in a sample about a portfolio's degree of inefficiency. With standard diffuse priors, posterior distributions

for measures of portfolio inefficiency can concentrate well away from values consistent with efficiency, even when the portfolio is exactly efficient in the sample. The data indicate that the NYSE-AMEX market portfolio is rather inefficient in the presence of a riskless asset, although this conclusion is justified only after an analysis using informative priors. Including a riskless asset significantly reduces any sample's ability to produce posterior distributions supporting small degrees of inefficiency.

On Inflation and Output with Costly Price Changes: A Simple Unifying Result

Roland Bénabou and Jerzy Konieczny

NBER Technical Paper No. 135

May 1993

JEL No. E31

Economic Fluctuations

We analyze the effect of inflation on the average output of monopolistic firms that face a small fixed cost of changing nominal prices. Using Taylor expansions, we derive a general closed-form solution for the slope of the long-run Phillips curve. This very simple, unifying formula allows us to evaluate and clarify the role of three key factors: the asymmetry of the profit function; the convexity of the demand function; and the discount rate. These partial equilibrium effects remain important components of any general equilibrium model with (s, S) pricing.

Identification of Causal Effects Using Instrumental Variables

Joshua D. Angrist, Guido W. Imbens, and Donald B. Rubin

NBER Technical Paper No. 136

June 1993

Labor Studies

We outline a framework for causal inference in settings in which random assignment has taken place, but compliance is not perfect: that is, the treatment received cannot be ignored. In an attempt to avoid the bias associated with simply comparing subjects by the randomized treatment assignment, we use instrumental variables, long used by economists in the context of regression models with *constant* treatment effects. We show that this technique can be fitted into the Rubin Causal Model and can be used for causal inference without assuming constant treatment effects. The advantages of embedding this approach in the Rubin Causal Model are that it makes the nature of the identifying assumptions more transparent, and that it allows us to consider sensitivity of the results to deviations from these assumptions in a straightforward manner.

The Cure Can Be Worse Than the Disease: A Cautionary Tale Regarding Instrumental Variables

John Bound, David A. Jaeger, and Regina Baker

NBER Technical Paper No. 137

June 1993

JEL Nos. C52, J31

Labor Studies

We draw attention to two problems associated with the use of instrumental variables (IVs) whose importance for empirical work has not been appreciated fully. First, using potential instruments that explain little of the variation in the endogenous explanatory variables can lead to large inconsistencies of the IV estimates, even if only a weak relationship exists between the instruments and the error in the structural equation. Second, in finite samples, IV estimates are biased in the same direction as ordinary least squares (OLS) estimates. The magnitude of the bias of IV estimates approaches that of OLS estimates as the R^2 between the instruments and the potentially endogenous explanatory variable approaches zero. To illustrate these problems with IV estimation, we reexamine the results of the provocative paper by Angrist and Krueger, "Does Compulsory School Attendance Affect Schooling and Earnings?" (NBER Working Paper No. 3571, December 1990). We find that their IV estimates of the effects of educational attainment on earnings are both inconsistent and suffer from finite sample bias. To gauge the severity of both problems, we suggest that both the partial R^2 and the F -statistic on the excluded instruments from the first stage estimation be reported when using IV.

From Each According to His Surplus: Equiproportionate Sharing of Commodity Tax Burdens

James R. Hines, Jr., John C. Hlisko, and Theodore J. Lubke

NBER Technical Paper No. 138

July 1993

JEL No. H22

Public Economics

This paper examines the incidence of commodity taxes. We find that when demand and marginal cost schedules are linear, the burden of commodity taxation is distributed between buyers and sellers, so that each suffers the same *percentage* reduction on pretax surplus. This equi-proportionate reduction in surplus occurs at any commodity tax rate, and is unaffected by relative demand and supply elasticities. Hence, when demand and marginal cost schedules are linear, commodity taxes resemble flat-rate taxes imposed on market surplus. Similar results apply to nonlinear schedules with certain ranges.

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