

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

Periodical Part

NBER Reporter Online, Volume 1992

NBER Reporter Online

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Suggested Citation: National Bureau of Economic Research (NBER) (Ed.) (1992) : NBER Reporter Online, Volume 1992, NBER Reporter Online, National Bureau of Economic Research (NBER), Cambridge, MA

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NBER Reporter

NATIONAL BUREAU OF ECONOMIC RESEARCH, INC.

SPRING 1992

Program Report

The Development of the American Economy

Claudia Goldin*

Researchers in the NBER's Program on the Development of the American Economy work primarily, but not exclusively, in the areas of labor and population, industrial organization, financial and macroeconomic history, and political economy. The group's unified goal is a better understanding of the evolution of the American economy and the roots of current policy issues. Because of the breadth of the work, I am able to highlight only two sets of research activities: one, in financial history, has been pursued actively by DAE members almost from the inception of the program; the other, in political economy, is a new initiative that will be the focus of a preconference in October 1992 and an NBER conference in May 1993.

Financial History in the DAE

A substantial group of NBER researchers—including Faculty Research Fellows Charles W. Calomiris and J. Bradford De Long, and Research Associates Michael D. Bordo, Lance E. Davis, Barry J. Eichengreen, Claudia Goldin, Naomi Lamoreaux, Hugh Rockoff, Christina D. Romer, Richard E. Sylla, and Eugene N. White—has been exploring the financial history of the United States. Their projects have revealed the long-run development of financial markets and institutions, as well as regulatory regimes and policy experiments of the past. Their work has explored the volatility of stock prices since the 1830s, the crash of 1929 and the Great Depression, regional differences in antebellum interest rates, bank reg-

*I thank J. Bradford De Long, Gary D. Libecap, Hugh Rockoff, Christina D. Romer, and Richard E. Sylla for their help in preparing this report.

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This issue of the *Reporter* highlights the Bureau's Program on the Development of the American Economy. Next, Francine D. Blau describes her research on gender and economic outcomes. Then, Michael D. Bordo reports on his work on the gold standard and other monetary regimes. After biographical sketches, news of NBER conferences, the Conference Calendar, and other NBER news and reports, the *Reporter* concludes with short summaries of recent Working Papers.

ulations such as deposit insurance, branch banking, and free banking, the transmission of economic fluctuations, and financial intermediation in the history of savings. A major priority of this group has been the development of new time-series data on the returns to financial assets and individual-level longitudinal data on savings.

Sylla, with Jack Wilson and Charles P. Jones, has compiled consistent monthly series on commercial paper rates, call money rates, and the return to corporate stocks and bonds from the 1830s to the present. They find that stock and bond markets were less volatile before 1914 than after, calling into question the efficacy of many regulations and reforms introduced in the twentieth century. They also find that, while there is a correlation between banking panics and stock market crashes, neither of the simplest hypotheses—that banking panics caused crashes, or the reverse—can explain the corre-

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

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lation satisfactorily.¹ Further work will be aimed at clarifying the relationships among stock market crashes, banking panics, and downturns in economic activity. They also have investigated the relationship between financial market conditions and the great merger wave in U.S. manufacturing at the turn of this century. They find that low stock prices produced increased merger activity, a result that contrasts with the findings of others for subsequent merger waves, but one they regard as consistent with investment theory.²

De Long has focused on the determinants of major long-run bull and bear markets in the United States and in other major industrial economies. He and NBER Research Associate Robert B. Barsky have found that major swings in the stock market since 1900 were driven by investors' extrapolations of the recent past into the future.³ Each boom saw the market rise, as investors expected it to persist indefinitely; each slump saw investors fear that America faced permanent economic stagnation.

White and Peter Rappoport also have begun a large-scale exploration of the stock market in the 1920s and 1930s. Using evidence from the call loan market, and new quarterly data on dividends, they find that lenders in the call market believed that the stock market was likely to experience a large decline in 1929, evidence suggesting that there was a bubble in the market. In research currently underway using newly collected cross-sectional data, White and Rappoport find evidence of excess comovement in stock prices, or "herding" behavior, but the phenomenon was more intense in the 1930s than during 1929, a surprising conclusion that suggests rumor and panic were important in the 1930s.⁴

In her continuing research on the Great Depression, Romer shows that capital and gold flight from Europe in the late 1930s led to a major expansion in the U.S. money supply.⁵ Thus America's partial success at recovery was caused by the resulting expansion in the money stock and the consequent decline in the real interest rate. Turbulence in Europe, not policy at home, was responsible. In related work, Eichengreen analyzes the

¹J. Wilson, R. E. Sylla, and C. P. Jones, "Financial Market Panics and Volatility in the Long Run, 1830–1988," in *Crashes and Panics: A Historical Perspective*, E. N. White, ed. Homewood, IL: Dow Jones Irwin, 1990; and R. E. Sylla, J. Wilson, and C. P. Jones, "U.S. Financial Markets and Long-Term Economic Growth," in *Economic Development in Historical Perspective*, D. Schaeffer and T. Weiss, eds. Stanford: Stanford University Press, forthcoming.

²R. E. Sylla, J. Wilson, and C. P. Jones, "Financial Markets and the Great Merger Wave of 1895–1904," forthcoming as an *NBER Historical Factors in Long-Run Growth Working Paper*.

³R. B. Barsky and J. B. De Long, "Bull and Bear Markets in the Twentieth Century," *Journal of Economic History* 50 (June 1990), pp. 1–17; and "Why Does the Stock Market Fluctuate?" *NBER Working Paper No. 3995*, February 1992.

⁴P. Rappoport and E. White, "Was There a Bubble in the 1929 Stock Market?," *NBER Working Paper No. 3612*, February 1991.

⁵C. D. Romer, "What Ended the Great Depression?" *NBER Working Paper No. 3829*, September 1991.

role played by the gold standard institutions of the 1920s and 1930s in the Great Depression. The belief by leaders in many countries that economic policy should maintain the gold standard, he argues, hobbled their countries' ability to respond to the cataclysm.⁶

Some time ago, Davis established that substantial differences in regional short-term interest rates existed for much of the late nineteenth century, but these rates converged on New York City's by about 1914. But Rockoff and Howard Bodenhorn, using a newly developed regional interest rate series, have shown recently that short-term markets also were highly integrated before 1860. Their findings suggest that regional disparities in short-term rates observed by the 1870s were caused, in part, by the economic disruptions of the American Civil War era.⁷ Prior to the Civil War, state laws created an era known as "free banking." Extending from 1838 to 1863, and characterized by free entry into banking and the issue of banknotes backed by state government bonds, free banking was a unique monetary experiment. Rockoff, who has studied its various lessons, concludes that generally it worked well and provided for rapid growth of the banking system, while affording protection for less sophisticated holders of bank liabilities.⁸

The relationship between the structure of banking and financial markets and the safety and soundness of the banking system also has been a major concern of financial historians. Calomiris has compared experiments with voluntary and compulsory deposit insurance schemes at the state level before the establishment of the FDIC. He finds that voluntary schemes were more successful than mandatory ones at preventing panics, and that branch banking made banking systems more resistant to shocks.⁹ Calomiris and Gary Gorton have investigated the origin of banking panics under the National Banking Act of 1864, and their findings reinforce the conclusion that branch banking would have eliminated, or at least mitigated, banking panics. Their work points to the need to determine whether open market operations are sufficient to resolve banking panics, or whether there is a distinct and important role for discount lending to individual banks.¹⁰

⁶B. J. Eichengreen, *Golden Fetters: The Gold Standard and the Great Depression, 1919–1939*, New York: Oxford University Press, 1992.

⁷H. Rockoff and H. Bodenhorn, "Regional Interest Rates in Antebellum America," in *Strategic Factors in Nineteenth Century American Economic History: A Volume to Honor Robert W. Fogel, C. Goldin and H. Rockoff*, eds. Chicago: University of Chicago Press, 1992; and H. Rockoff, "The Capital Market in the 1850s," *NBER Historical Factors in Long-Run Growth Working Paper No. 11*, January 1990.

⁸H. Rockoff, "Lessons from the American Experience with Free Banking," in *Unregulated Banking: Chaos or Order?* F. Capie and G. Wood, eds. London: Macmillan Academic and Professional Ltd., 1991.

⁹C. W. Calomiris, "Is Deposit Insurance Necessary? A Historical Perspective," *Journal of Economic History* 50 (June 1990), pp. 283–295.

¹⁰C. W. Calomiris and G. Gorton, "The Origins of Banking Panics: Models, Facts, and Bank Regulation," in *Financial Markets and Financial Crises*, R. G. Hubbard, ed. Chicago: University of Chicago Press, 1991.

Nonfinancial corporations are linked closely to the financial sector, which is both a source of capital and an important influence on corporate governance. Lamoreaux has examined the shifting relationship between New England banks and firms in the nineteenth century.¹¹ Although commercial banks were less involved in the activities of firms by the end of the nineteenth century, investment banks remained closely linked to firm governance, as De Long shows in his work on the J. P. Morgan financial empire.¹² Morgan's "money trust" reaped extraordinarily high profits in the early twentieth century, yet the firms under its control were well-managed and profitable. In view of the risks of investing in the early 1900 stock market, investors eagerly and amply rewarded Morgan and Company in exchange for financial security.

Focusing on 1880 to 1914 under the National Banking Act, Bordo, Rappoport, and Anna J. Schwartz examine whether banking panics forced declines in business activity primarily through decreases in the stock of money or through bank credit rationing. They show that once the effect of the stock market is taken into account (most of the variability in bank lending was in loans secured by stocks), the money supply and not bank credit rationing was the most important channel through which business activity was influenced.¹³

Most of the research in the financial history group within the DAE uses data on banks and financial instruments. Personal savings account records for the nineteenth century are the focus of a new project. With George Alter and Elyce Rotella, I have collected individual-level longitudinal savings account information from the Philadelphia Savings Fund Society (PSFS) that reveals who saved and why. PSFS was established in 1816 as the first mutual savings bank in the United States and was chartered to enable the ordinary laborer to save. From a dataset that currently contains all accounts opened in 1850, we find that most savers probably accumulated funds to purchase physical assets, that female servants may have been the only group engaging in life-cycle saving, and that very few accounts reveal precautionary savings motives.¹⁴

¹¹N. Lamoreaux, "Information Problems and Banks' Specialization in Short-Term Commercial Lending: New England in the Nineteenth Century," in *Inside the Business Enterprise: Historical Perspectives on the Use of Information*, P. Temin, ed. Chicago: University of Chicago Press, 1991.

¹²J. B. De Long, "Did J. P. Morgan's Men Add Value?" in *Inside the Business Enterprise*.

¹³M. D. Bordo, P. Rappoport, and A. J. Schwartz, "Money versus Credit Rationing: Evidence for the National Banking Era, 1880–1914," *NBER Working Paper No. 3689*, April 1991, and in *Strategic Factors in Nineteenth Century American Economic History*.

¹⁴G. Alter, C. Goldin, and E. Rotella, "Motives for Savings: The Philadelphia Saving Fund Society in the Mid-Nineteenth Century," forthcoming as an *NBER Historical Factors in Long-Run Growth Working Paper*.

Historical Political Economy in the DAE

A new research initiative in historical political economy has been inaugurated by the DAE. The goal is to encourage research on the origins, development, and impact of government policies and actions in the economy. Despite their importance, the sources and effects of government economic activities at the local, state, and federal levels remain poorly understood. Analyses of government regulation have tended to view policies in isolation at particular points in time, ignoring how regulation is initiated and modified by the political process. By taking a dynamic and longer-term historical perspective, the group can study why policies are adopted initially, how they are adjusted later, and whom they serve. The object is to understand the endogeneity of government regulation, through in-depth case studies.

A recently completed study by Libecap on the origins of federal meat inspection and antitrust provides an example of the type of research being encouraged.¹⁵ Libecap finds a surprising link between the country's first law for federal inspection of food quality, the Meat Inspection Act of 1891, and the first federal antitrust law, the Sherman Act of 1890. Much of the political pressure for antitrust legislation and meat inspection came from small meat packers and farmers, not from consumer groups. Small meat packers and farmers sought antitrust relief against the Chicago packers, whom they labeled the Beef Trust. By 1890, four firms—Swift, Armour, Morris, and Hammond—and their new product, refrigerated beef, had secured approximately 50 percent of the U.S. meat market. Through the use of refrigeration technology and economies of scale in production, marketing, and shipping, the four firms displaced smaller local slaughterhouses.

In an effort to discredit refrigerated beef, the local slaughterhouses claimed that the packers used diseased cattle. They lobbied for local inspection laws that would have blocked the interstate shipment of refrigerated beef. Although there is no evidence of an actual health danger, the disease issue had the unintended consequence of damaging American export markets in beef. In 1889, twenty states either considered or passed local meat inspection laws, but in a test case, the Supreme Court struck them down. Twelve states adopted antitrust legislation in 1889, and much of the legislation was focused on the alleged Beef Trust. The Sherman Act eventually was passed in 1890, after considerable lobbying by midwestern farmers, who claimed the Beef Trust exercised oligopsony power, and after a major congressional investigation (one of but three concerning trusts) into the Chicago packers. After the Sherman Act was enacted, Congress addressed the livestock disease issue through the Meat Inspection Act of 1891 in an effort to calm fears abroad over the wholesomeness of American

cattle and meat products. Thus, the Sherman Act was championed by the competitors of the large meat packers who, in their zealotry to discredit the Beef Trust, unwittingly discredited the product. In this manner, antitrust at the federal level was tied to meat inspection.

The aforementioned DAE preconference and conference, titled "The Political Economy of Regulation: A Historical Analysis of Government and the Economy," will culminate in a book. The topics will include early twentieth century immigration restrictions, workers' compensation legislation, the origins of bank deposit insurance, early transportation and utility regulation, and New Deal agricultural policies, many of which are still with us.

Research Summaries

Gender and Economic Outcomes

Francine D. Blau

The past 20 years have seen decreasing gender differences in occupations and industries and, particularly in the 1980s, increasing relative earnings for women. Women's participation in the labor force also has continued to increase, as they have become more likely to work over most of their adult lives.¹ My research attempts to help us understand the sources of, and recent trends in, gender differences in economic outcomes. I also hope to shed light on the social consequences of the changes in gender roles that underlie these developments.

Overview of Trends

In recent years, both white and black women have narrowed the earnings gap relative to men of the same race. For white women, the annual earnings ratio adjusted for hours and weeks worked rose from 60 percent in 1971 to 74 percent in 1988. For black women relative to black men, the same ratio rose from 68 percent in 1971 to 86 percent in 1988. White women made slow progress relative to white men in the 1970s, and considerably more rapid progress in the 1980s. The pace of change for black women was more similar over the course of the two decades, but their earnings ratio did increase at a higher annual rate in the 1980s.² In addition,

¹The recent trends are summarized in F. D. Blau and M. A. Ferber, *The Economics of Women, Men, and Work*, 2nd ed. Englewood Cliffs, NJ: Prentice-Hall, forthcoming.

²F. D. Blau and L. M. Kahn, "Race and Gender Pay Differentials," in *Research Frontiers in Industrial Relations*, D. Lewin, O. S. Mitchell and P. Sherer, eds. Madison, WI: Industrial Relations Research Association, forthcoming.

¹⁵G. D. Libecap, "The Rise of the Chicago Packers and the Origins of Meat Inspection and Antitrust," *NBER Historical Factors in Long-Run Growth Working Paper No. 29*, September 1991, and *Economy Inquiry*, forthcoming.

although the earnings of black men and women stagnated relative to whites of the same sex during the 1980s, black women continued to narrow the gap with white men over this period.³ Occupational differences between males and females also narrowed over the 1970s and 1980s. The index of segregation, a measure of the proportion of women (or men) who would have to change jobs for the occupational distribution of the two sexes to be the same, fell from 67 to 57 percent between 1970 and 1987.⁴ However, in this case, the pace of change was faster in the 1970s than in the 1980s. Women made particular progress in entering traditionally male managerial and professional jobs, and the fraction of older black women in private household occupations fell sharply.⁵ Gender differences in industrial distribution also narrowed over the 1970s and 1980s, for both black and white women.⁶

Determinants of the Gender Earnings Gap

Traditionally there have been two primary explanations for the gender gap. First, women suffer from discrimination in the labor market. Second, because many women work part time, or drop out of and then reenter the work force, they have less human capital and are less productive than men of similar age and education. Both discrimination and differences in human capital affect the pay gap, although precisely determining the relative importance of each is difficult.⁷

Analyses of trends over time in the gender differential, as well as intercountry comparisons of the gender earnings ratio, have tended to emphasize these factors. But my current work with Lawrence M. Kahn on international comparisons of the gender gap suggests that an additional factor, wage structure, is of considerable importance in explaining differences across countries, and perhaps in explaining trends over time within the United

States as well.⁸ Wage structure describes the array of prices set for various labor market skills (measured and unmeasured) and the rents received for employment in particular sectors of the economy. The impact of wage structure on intercountry differentials in the gender gap can be illustrated by the following examples: suppose that in two countries women have lower levels of skills than men, but that this difference in skills is the same in the two countries. If the return to skill is higher in one country, then it will have a higher gender pay gap. Or, suppose that the extent of occupational segregation by sex is the same in two countries, but that the wage premium associated with working in a predominantly male occupation is higher in one country. Then, again, that country will have a higher pay gap.

Using microdata from nine industrialized countries, we find that wage structure is an important determinant of cross-country differences in the gender earnings ratio. Specifically, the higher level of wage inequality in the United States increases the gender differential in the United States relative to all other countries in our sample.⁹ Most strikingly, wage structure fully accounts for the lower gender earnings ratio in the United States compared to the Scandinavian countries and Australia (the countries with the smallest gaps). This explains the seemingly paradoxical position of U.S. women compared to women elsewhere. U.S. women compare favorably to women in other countries on several measures of skills relative to men. Moreover, the United States has had a longer commitment to equal pay and equal employment opportunity policies than the other countries in our sample. Yet the gender pay gap in the United States is considerably larger than in the other countries in our sample.

A variety of factors may explain the higher level of wage inequality in the United States, but we see the wage-setting institutions of each country as being particularly important. Centralized wage-setting institutions, which tend to reduce interfirm and interindustry wage variation and often are associated with conscious policies to raise the relative pay of low-wage workers (regardless of gender), may reduce the gender pay gap indirectly. U.S. pay-setting is far less centralized than that of virtually all of the countries in our study, with the possible exception of Switzerland.

³F. D. Blau and A. H. Beller, "Black-White Earnings over the 1970s and 1980s: Gender Differences in Trends" NBER Working Paper No. 3736, June 1991, and *Review of Economics and Statistics*, forthcoming.

⁴F. D. Blau, "Occupational Segregation by Gender: A Look at the 1980s," paper presented at the American Economic Association Annual Meetings, New York, December 1988, revised January 1989.

⁵F. D. Blau and A. H. Beller, "Black-White Earnings over the 1970s and 1980s."

⁶F. D. Blau and L. M. Kahn, "Race and Gender Pay Differentials."

⁷F. D. Blau and M. A. Ferber, "Discrimination: Evidence from the United States," *American Economic Review* 77 (May 1987), pp. 316-320. For a summary of the theoretical approaches, see F. D. Blau, "Gender," in *The New Palgrave: A Dictionary of Economic Theory and Doctrine*, Vol. 2, J. Eatwell, M. Milgate, and P. Newman, eds. New York: Macmillan, 1987, Vol. 2, pp. 492-498.

⁸F. D. Blau and L. M. Kahn, "The Gender Earnings Gap: Some International Evidence," paper presented at the NBER conference on "Differences and Changes in Wage Structures," London, 1991; and F. D. Blau and L. M. Kahn, "The Gender Earnings Gap: Learning from International Comparisons," *American Economic Review*, forthcoming. For an overview of intercountry differences in the economic status of women, see also F. D. Blau and M. A. Ferber, "Women's Work, Women's Lives: A Comparative Perspective," NBER Working Paper No. 3447, September 1990, and in *Women's Lives and Women's Work in Modernizing and Industrial Countries*, H. Kahne and J. Giele, eds. Boulder, CO: Westview Press, forthcoming.

⁹In doing this work, we adapt a framework developed by C. Juhn, K. M. Murphy, and B. Pierce ("Accounting for the Slowdown in Black-White Wage Convergence," unpublished manuscript, October 1989) to analyze black-white wage trends in the United States.

Understanding the Trends

Why did the gender earnings gap begin to close in the 1980s after relatively little progress during the 1970s? Wage inequality in the United States was increasing over both decades, principally because of rising returns to skill.¹⁰ During the 1970s, there was little to counterbalance this adverse trend. However, in the 1980s, a number of positive developments more than offset the negative impact of rising inequality.

In the 1970s, the potentially positive effect of the increasing representation of women in traditionally male occupations and industries was offset by adverse (for women) changes in occupational and industrial wage premiums.¹¹ That is, increasing earnings associated with working in disproportionately male sectors lowered the relative earnings of women who were still underrepresented in those sectors. Shifts in returns, particularly rising returns to employment in male occupations, may reflect the impact of the increasing returns to skill that I noted earlier. In addition, increases in female labor force participation, especially by mothers of young children, tended to reduce the average age and experience of women relative to men during the 1970s.¹²

That women's relative earnings did not decline in spite of all these adverse changes, but rather increased somewhat during this period, may reflect a reduction in labor market discrimination. This, in turn, may be a result of the government's antidiscrimination efforts, which may have been more successful than generally recognized.¹³ In addition, education differences between men and women declined over the decade as an increasing percentage of women enrolled in college and professional schools, especially in traditionally male fields of specialization.¹⁴

During the 1980s, while returns to employment in male occupations continued to rise,¹⁵ changes in industry wage coefficients favored women.¹⁶ This development most likely reflects shifts in industry demand, particularly a decline in the manufacturing sector and an increase in services.¹⁷ At the same time, the women who entered the labor force during the 1970s did not stay home to raise their children, as their mothers did. As a result, women's average experience levels began to rise relative to men's during the 1980s.¹⁸ Gender differences in level and type of education continued to narrow.

A Look at the Future

Recent increases in the labor force participation of women, and a growing tendency of women to remain employed more continuously over the life cycle, have meant that a rising percentage of young children have mothers who work outside the home. There is every indication that this pattern will persist into the future and that younger women will be more firmly attached to the labor force than their predecessors were.¹⁹ Adam J. Grossberg and I have examined the impact on the child's cognitive development of maternal employment during the first three or four years of a child's life, as measured by standardized test scores.²⁰ We find that a mother's working throughout the child's first three or four years of life has little or no net effect on the child's cognitive development. This finding was the result of two offsetting effects: children whose mothers worked throughout their first year scored lower than otherwise similar children, while children whose mothers worked during the second and subsequent years scored higher, all else equal.

Our study suggests that the employment of mothers of young children has little effect on their cognitive development. If, however, maternal employment has any deleterious effects, they are most likely centered on the first year of life. Public policies designed to improve the quality of alternative care during this time, and/or to encourage

¹⁰C. Juhn, K. M. Murphy, and B. Pierce, "Wage Inequality and the Rise in Returns to Skill," paper presented at the NBER-Universities Research Conference, "Labor Markets in the 1990s," November 1989.

¹¹F. D. Blau and A. H. Beller, "Trends in Earnings Differentials by Gender: 1971-81," *Industrial and Labor Relations Review* 41 (July 1988), pp. 513-529; and F. D. Blau and L. M. Kahn, "Race and Gender Pay Differentials."

¹²S. Polachek, "Trends in Male-Female Wages: Differences Between the 1970s and the 1980s," paper presented at the American Economic Association Annual Meetings, Washington, DC, December 1990; and C. Goldin, *Understanding the Gender Gap: An Economic History of American Women*, New York: Oxford University Press, 1990.

¹³For evidence that discrimination as conventionally measured declined over the 1970s, see F. D. Blau and A. H. Beller, "Trends in Earnings Differentials by Gender: 1971-81." For evidence of the impact of the laws, see A. H. Beller, "The Impact of Equal Opportunity Policy on Sex Differentials in Earnings and Occupations," *American Economic Review* 72 (May 1982), pp. 171-175.

¹⁴F. D. Blau and M. A. Ferber, *The Economics of Women, Men and Work*.

¹⁵J. O'Neill and S. Polachek, "Why the Gender Gap in Wages Narrowed in the 1980s," unpublished manuscript, November 1991.

¹⁶F. D. Blau and L. M. Kahn, "Race and Gender Pay Differentials."

¹⁷L. F. Katz and K. M. Murphy, "Changes in Relative Wages, 1963-87: Supply and Demand Factors," NBER Working Paper No. 3927, December 1991, and *Quarterly Journal of Economics*, forthcoming.

¹⁸S. Polachek, "Trends in Male-Female Wages: Differences Between the 1970s and the 1950s," and J. O'Neill and S. Polachek, "Why the Gender Gap in Wages Narrowed in the 1980s."

¹⁹F. D. Blau and M. A. Ferber, "Career Plans and Expectations of Young Women and Men: The Earnings Gap and Labor Force Participation," NBER Working Paper No. 3445, September 1990, and *Journal of Human Resources* 26 (Fall 1991), pp. 581-607.

²⁰F. D. Blau and A. J. Grossberg, "Maternal Labor Supply and Children's Cognitive Development," NBER Working Paper No. 3536, December 1990, and *Review of Economics and Statistics*, forthcoming.

greater opportunities for parental leaves during this period, might offset these effects. With or without government mandates, however, as more women with young children work and as men play a greater role within the family, an increasing number of employers are finding it profitable to develop benefits and policies that assist workers in balancing job and family responsibilities.

The Gold Standard and Other Monetary Regimes

Michael D. Bordo

In recent years, my research has focused on three topics that I discuss here: the performance of the gold standard and its Bretton Woods variant; the gold standard as a rule—that is, as a credible commitment mechanism; and the performance of alternative monetary rules.

The Performance of the Gold Standard and Bretton Woods Monetary Regimes

Under the classical gold standard, adherents' monetary authorities were required to fix the prices of their currencies in terms of a fixed weight of gold and to buy and sell gold freely in unlimited amounts. The pledge to fix the price of gold provided a nominal anchor for the international monetary system. Under the Bretton Woods system, in contrast, only the United States fixed the price of the dollar in terms of gold. All other convertible currencies were pegged to the dollar. Also under Bretton Woods, free convertibility of gold into dollars was limited. Thus, Bretton Woods was a weak variant of the gold standard.

Comparing the performance of a number of important nominal and real macro variables across four regimes (the classical gold standard, the interwar period, Bretton Woods, and floating exchange rates) for the G-7 countries, using annual data, reveals that the Bretton Woods system was the most stable for virtually every variable. The gold standard was second. Further, the Bretton Woods convertible period (1959–71) had the lowest standard deviation of both the inflation rate and the growth of real output.¹ Under the classical gold standard, the standard deviation of both variables was higher than under Bretton Woods and the recent float.²

¹M. D. Bordo, "The Bretton Woods International Monetary System: An Historical Overview," forthcoming as an NBER Working Paper.

²M. D. Bordo, "The Classical Gold Standard: Some Lessons for Today," Federal Reserve Bank of St. Louis Review 63, (May 1981), pp. 2–17; R. Cooper, "The Gold Standard: Historical Facts and Future Prospects," Brookings Papers on Economic Activity 13 (1982), pp. 1–45; and A. Meltzer and S. Robinson, "Stability Under the Gold Standard in Practice," in Essays in Honor of Anna J. Schwartz, M. D. Bordo, ed. Chicago: University of Chicago Press, 1989, pp. 113–202.

Although the classical gold standard was not characterized by short-run price stability, it did exhibit long-run price stability from 1821–1914.³ For a number of key countries from the eighteenth century to the present, the gold standard episodes are virtually without inflation persistence compared to the post–World War II era when inflation is significant and positive.⁴ Inflation persistence was lower in the fully convertible Bretton Woods period (1959–71) than in the preconvertible period and the subsequent floating exchange rate period.⁵ This illustrates the importance of the stable nominal anchor provided by the gold standard and its Bretton Woods variant.⁶ As is argued in the next section, the gold standard also may have provided a credible commitment mechanism.

Finally, although the Bretton Woods system in its convertible phase was the most stable monetary regime of the past century, it was also short-lived. Whether it was stable because of the regime, or because of the absence of large shocks compared to other regimes, is an empirical question. Some recent evidence suggests it reflected both influences.⁷

The Bretton Woods system collapsed both because of fatal flaws in its design (the adjustable peg in the face of improved capital mobility, and the confidence problem associated with the gold dollar standard) and conflicting policy objectives between the key deficit and surplus countries.⁸

³M. D. Bordo, "The Classical Gold Standard." According to B. Klein, "Our New Monetary Standard: Measurement and Effects of Price Uncertainty 1890–1973," Economic Inquiry 13, pp. 461–484, the gold standard also provided long-run price predictability.

⁴R. B. Barsky, "The Fisher Hypothesis and the Forecastability and Persistence of Inflation," Journal of Monetary Economics 19, 1 (1987), pp. 3–24; M. D. Bordo and F. E. Kydland, "The Gold Standard as a Rule," NBER Working Paper No. 3367, May 1990; and G. Alogoskoufis and R. Smith, "The Phillips Curve, the Persistence of Inflation, and the Lucas Critique: Evidence from Exchange Rate Regimes," American Economic Review 81, 2 (1991), pp. 1254–1273.

⁵See B. J. Eichengreen, "Three Perspectives on the Bretton Woods System," in A Retrospective on the Bretton Woods System, M. D. Bordo and B. J. Eichengreen, eds. Chicago: University of Chicago Press, forthcoming.

⁶The evidence also suggests that long-run price stability under the gold standard was produced by the operation of the classical commodity theory of money. See M. D. Bordo, "The Classical Gold Standard," and H. Rockoff, "Some Evidence on the Real Price of Gold, Its Costs of Production, and Commodity Prices," in A Retrospective on the Classical Gold Standard, 1921–1931, M. D. Bordo and A. J. Schwartz, eds. Chicago: University of Chicago Press, 1984, pp. 613–644. However, when account is taken of the fact that gold is a durable resource subject to depletion, my research suggests that the gold standard may be subject to a deflationary bias. See M. D. Bordo and R. E. Ellson, "A Model of the Classical Gold Standard with Depletion," Journal of Monetary Economics 16, 1 (July 1985), pp. 109–120.

⁷B. J. Eichengreen, "Three Perspectives. . ."

⁸M. D. Bordo, "The Bretton Woods International Monetary System"; and M. Obstfeld, "The Adjustment Mechanism," and P. Garber, "The Collapse of the Bretton Woods Fixed Exchange Rate System," in A Retrospective on the Bretton Woods System.

The Gold Standard as a Commitment Mechanism

The evidence that inflation under the gold standard and Bretton Woods was markedly less persistent than under regimes without a nominal anchor suggests that the gold standard rule of convertibility was a credible commitment mechanism. In the recent literature on the time inconsistency of optimal government policy, the absence of such a mechanism leads governments that pursue stabilization policies to experience inflation.⁹ Once the monetary authority has announced a given rate of monetary growth, believing that the public expects it to follow through, the authority has an incentive to create a monetary surprise either to reduce unemployment or to capture seigniorage revenue. With rational expectations, the public will come to anticipate the authorities' perfidy, leading to an inflationary equilibrium. A credible precommitment mechanism, by preventing the government from cheating, can preserve long-run price stability. The gold standard rule of maintaining a fixed price of gold can be viewed as such a mechanism.

The gold standard is a form of contingent rule.¹⁰ The monetary authority maintains the standard except in the event of a well-understood emergency, such as a major war. In wartime it may suspend gold convertibility and issue paper money to finance its expenditures; it also can sell debt issues in terms of the nominal value of its currency, on the understanding that the debt eventually will be paid off in gold. The rule is contingent in the sense that the public understands that the suspension will last only for the duration of the wartime emergency plus some period of adjustment: afterward the government will follow the deflationary policies necessary to resume payments at the original parity. Following such a rule also will allow the government to smooth its revenue from different sources of finance: taxation, borrowing, and seigniorage.¹¹

My research with Finn E. Kydland shows that the gold standard contingent rule worked successfully for three core countries: Britain, the United States, and France. In

these countries, the monetary authorities adhered faithfully to the fixed price of gold except during major wars. During the Napoleonic War and World War I for England, the Civil War for the United States, and the Franco-Prussian War for France, specie payments were suspended, and paper money and debt were issued. But in each case, after the wartime emergency had passed, policies for successful resumption were followed.¹² Indeed, successful adherence to the rule may have enabled the belligerents to obtain access to debt finance more easily in subsequent wars. Other countries, including Italy, which did not maintain gold convertibility continuously, followed policies consistent with long-run convertibility.¹³

The gold standard rule also may have been enforced by reputational considerations. Long-run adherence to the rule was based on the historical evolution of the gold standard. Gold was accepted as money because of its intrinsic value and desirable properties. Paper claims, developed to economize on the scarce resources tied up in a commodity money, became acceptable only because they were convertible into gold. Support for the international gold standard likely grew because it provided improved access to the international capital markets of the core countries. Countries were eager to adhere to the standard because they believed that gold convertibility would be viewed by creditors as a signal of sound government finance and the future ability to service debt.¹⁴

The Bretton Woods system also can be understood as a form of contingent rule (or rule with escape claus-

¹²A case study comparing British and French finances during the Napoleonic Wars shows that Britain was able to finance its wartime expenditures by a combination of taxes, debt, and paper money issue—to smooth revenue; whereas France had to rely primarily on taxation. France had to rely on a less efficient mix of finance than Britain did because she had used up her credibility by defaulting on outstanding debt at the end of the American Revolutionary War and by hyperinflation during the Revolution. Napoleon ultimately returned France to the bimetallic standard in 1803 as part of a policy to restore fiscal probity, but because of the previous loss of reputation, France was unable to take advantage of the contingent aspect of the bimetallic standard rule. See M. D. Bordo and E. N. White, "A Tale of Two Currencies: British and French Finance During the Napoleonic War," NBER Reprint No. 1676, December 1991, and *Journal of Economic History* 51, 2 (1991), pp. 303–316.

¹³Evidence based on the behavior of asset prices (exchange rates and interest rates) suggests that market agents viewed the commitment to gold as credible. See C. W. Calomiris, "Price and Exchange Rate Determination During the Greenback Suspension," *Oxford Economic Papers* (December 1988), and A. Giovannini, "Bretton Woods and Its Precursors."

¹⁴A case study of Canada during the Great Depression provides evidence for the importance of the credible commitment mechanism of adherence to gold. Canada suspended the gold standard in 1929 but did not allow the Canadian dollar to depreciate nor the price level to rise for two years. Canada did not take advantage of the suspension and follow other countries out of the Depression because of concern over credibility by foreign lenders. See M. D. Bordo and A. Redish, "Credible Commitment and Exchange Rate Stability: Canada's Interwar Experience," NBER Reprint No. 1481, January 1991, and *Canadian Journal of Economics* 23, 2 (May 1990), pp. 357–380.

⁹F. E. Kydland and E. Prescott, "Rules Rather Than Discretion: The Inconsistency of Optimal Plans," *Journal of Political Economy* 85 (1977), pp. 473–491, and R. J. Barro and D. Gordon, "Rules, Discretion, and Reputation in a Model of Monetary Policy," *Journal of Monetary Economics* 12 (1983), pp. 101–121.

¹⁰M. D. Bordo and F. E. Kydland, "The Gold Standard as a Rule," NBER Working Paper No. 3367, May 1990, and G. de Kock and V. U. Grilli, "Endogenous Exchange Rate Regime Switches," NBER Working Paper No. 3066, August 1989, view the contingent rule as a trigger strategy equilibrium. Also see A. Giovannini, "Bretton Woods and Its Precursors: Rules versus Discretion in the History of International Monetary Regimes," NBER Working Paper No. 4001, February 1992, and in A Retrospective on the Bretton Woods System.

¹¹R. F. Lucas and N. L. Stokey, "Optimal Fiscal and Monetary Policy in an Economy Without Capital," *Journal of Monetary Economics* 12 (1983), pp. 55–93, and N. G. Mankiw, "The Optimal Collection of Seigniorage—Theory and Evidence," *Journal of Monetary Economics* 20 (1989), pp. 327–341.

es).¹⁵ For nonreserve currency countries, the rule was to maintain fixed parities, except in the contingency of a fundamental disequilibrium in the balance of payments, and to use monetary and fiscal policy to smooth out short-run disturbances. For the United States, the center country, the rule was to fix the gold price of the dollar at \$35 per ounce and to maintain price stability. However, if a majority of members (and every member with 10 percent or more of the total quotas) agreed, the United States could change the dollar price of gold.

For the nonreserve currency countries, the rule was defective because the fundamental contingency was not spelled out, and no constraint was placed on the extent to which domestic financial policy could stray from maintaining external balance. For the United States, the rule suffered from a number of flaws. First, because of the fear of a confidence crisis, the gold convertibility requirement prevented the United States in the early 1960s from acting as a center country and elastically supplying the reserves demanded by the rest of the world. Second, as became evident in the later 1960s, the U.S. gold reserve requirement was useless in preventing the U.S. monetary authorities from pursuing an inflationary policy that, in the end, undermined the system. Finally, although there was a mechanism for the United States to revalue the dollar, the monetary authorities were loath to use it for fear of permanently undermining confidence in the dollar.

The short life of Bretton Woods, the fact that its existence was punctuated by more speculative attacks on currencies than under the classical gold standard, and evidence that its credibility bounds (gold points) were frequently violated,¹⁶ suggests that it was a less-than-successful credible commitment mechanism

Alternative Monetary Rules

Many economists have argued that monetary rules would be superior to discretionary monetary policy in providing stable prices and output.¹⁷ In the 1960s and 1970s, economists compared alternative hypothetical rules with actual performance using macroeconomic models.¹⁸ This effort ignored the Lucas critique: that estimated parameters of the model would change in response to a regime change.¹⁹ With Ehsan U. Choudhri

¹⁵M. D. Bordo, "The Bretton Woods International Monetary System," and A. Giovannini, "Bretton Woods and Its Precursors."

¹⁶A. Giovannini, "Bretton Woods and Its Precursors."

¹⁷M. Friedman, *A Program for Monetary Stability*, New York: Fordham University Press, 1960, and F. E. Kydland and E. Prescott, "Rules Rather Than Discretion."

¹⁸F. Modigliani, "Some Empirical Tests of Monetary Management and Rules versus Discretion," *Journal of Political Economy* 72 (1964), pp. 211–245.

¹⁹R. F. Lucas, "Econometric Policy Evaluation: A Critique." *Carnegie-Rochester Conference Series on Public Policy*, 1 (1976), pp. 19–46.

and Anna J. Schwartz, I have developed a method to make counterfactual comparisons of alternative monetary rules to avoid this problem. Using the Beveridge–Nelson technique,²⁰ we isolate underlying components of variables that do not change with regimes.

We use our procedure to compare the variance of the price level forecasts under the monetary regime followed by the United Kingdom from 1976–85, which incorporated base drift, with a hypothetical constant money growth rule. The United Kingdom would calculate the next period's target level on the base of the actual, rather than the previously announced, target level for the current period. Our results suggest that if the Bank of England had followed a constant money growth rule, the forecast variance of the trend price level would have been reduced by more than half.

Our current research extends the same methodology to the United States since 1880. We compare the price level and output stability of the various monetary regimes that prevailed. For each regime, we plan to estimate both trend and short-run components of nominal as well as real variables, and then to identify the effects of both long- and short-run factors on overall variability of prices and output. We also will simulate the effects of three types of policy rules, each of which has been studied in recent literature: simple monetary growth rules, feedback rules, and a gold standard rule or a commodity basket rule. In that way, we will address the question of whether a monetary rule would have done much better in promoting long-run price stability than the Federal Reserve's monetary policy in each of the monetary regimes since 1914. Finally, we will simulate the short-run behavior of money supply under alternative rules in order to examine the implication of these rules for the short-run behavior of output.

²⁰M. D. Bordo, E. U. Choudhri, and A. J. Schwartz, "Money Stock Targeting, Base Drift, and Price Level Predictability: Lessons from the U.K. Experience." *NBER Reprint No. 1506*, February 1991, and *Journal of Monetary Economics* 25 (March 1990), pp. 253–272; and S. Beveridge and C. Nelson, "A New Approach to Decomposition of Economic Time Series into Permanent and Transitory Components with Particular Attention to Measurement of the 'Businesscycle,'" *Journal of Monetary Economics* 7 (1981), pp. 151–174.

Profiles

Francine D. Blau

Francine D. Blau has been an NBER research associate in labor studies since 1988. She received a B.S. from Cornell University, and an M.A. and Ph.D. from Harvard University. Blau joined the University of Illinois at Urbana–Champaign in 1975 as an assistant professor of economics and labor and industrial relations. She was promoted to associate professor in 1978, and to full professor in 1983.



Her research has focused on women's economic status and discrimination against women in the labor market. She recently coauthored *The Economics of Women, Men, and Work* with Marianne Ferber. Blau also has done research on immigration, job search and labor turnover, and union impact and racial differences in employment.

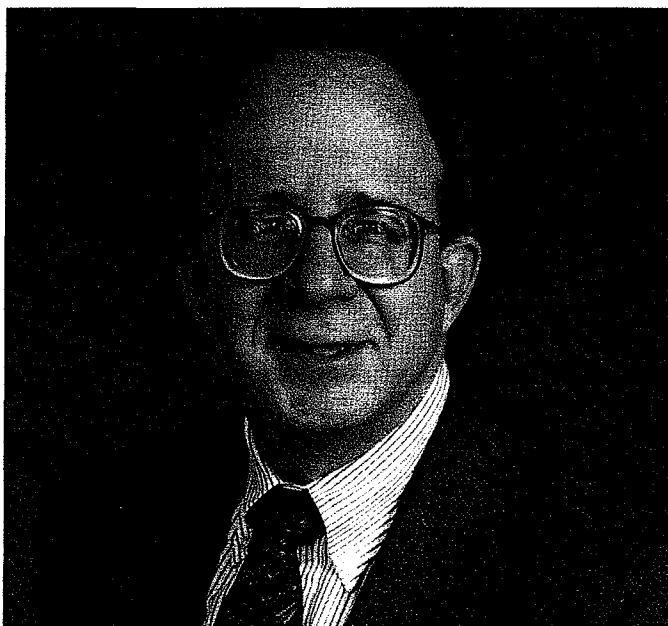
Blau is currently president of the Midwest Economics Association. She has served on the Executive Board of the Industrial Relations Research Association, and on the National Academy of Science's panels investigating technology and women's employment and the issue of pay equity.

Blau's husband, Lawrence Kahn, is also a professor of economics and industrial relations at the University of Illinois at Urbana-Champaign. They have two children, Danny (12) and Lisa (10). Blau enjoys old movies, aerobics, and walking.

Michael D. Bordo

Michael D. Bordo has been an NBER research associate since 1982 and is a member of both the Monetary Economics and Development of the American Economy programs. He is a professor of economics at Rutgers University and, since 1990, he also has served as direc-

A native of Montreal, Bordo received his B.A. from McGill University, his M.Sc. from the London School of Economics, and his Ph.D. from the University of Chicago. He began his teaching career at Carleton University (Ottawa) in 1969, and taught at the University of South Carolina from 1981-9 before joining the Rutgers faculty. He has been a visiting professor at Carnegie-Mellon University, Erasmus University in Rotterdam, Lund University in Sweden, and the University of California at Los Angeles.



Bordo and his wife, Ruth, now live in Highland Park, New Jersey, with their children: Jennifer (9) and Matthew (6). In addition to the demands of an active family, Bordo enjoys jogging, skiing, and swimming.

Conferences

Growth and Development: New Theory and Evidence

On January 9 and 10, the NBER, the London-based Centre for Economic Policy Research, and the Tokyo Center for Economic Research jointly sponsored a conference on "Growth and Development: New Theory and Evidence" in Tokyo. The program, organized by Takatoshi Ito, NBER and Hitotsubashi University, and Hiroshi Yoshikawa, University of Tokyo, was:

Robert J. Barro, NBER and Harvard University, and Xavier Sala-i-Martin, NBER and Yale University, "Regional Growth and Migration: A Japan-U.S. Comparison"

Discussants: Ryoko Okazaki, Bank of Japan, and Shumpei Takemori, Keio University

Kiminori Matsuyama, NBER and Northwestern University, "The Market Size, Entrepreneurship, and the Big Push"

Discussants: Rudiger Dornbusch, NBER and MIT, and Masahiro Okuno-Fujiwara, University of Tokyo

Ross Levine, World Bank, "Financial Intermediation and Growth: Theory and Evidence"

Discussants: Shinji Takagi, Osaka University, and Kazuo Ueda, University of Tokyo

Daniel Cohen, University of Paris, "Foreign Finance and Growth"

Discussants: Shinichi Fukuda, Yokohama National University, and Michihiro Ohyama, Keio University

Gilles Saint-Paul and Thierry Verdier, DELTA, Paris, "Historical Accidents and the Persistence of Distributional Conflicts"

Discussants: Tsuneo Ishikawa, University of Tokyo, and Yasushi Ohkusa, Osaka University

Hiroshi Yoshikawa, University of Tokyo, Tetsuji Okazaki, University of Tokyo, and Hajime Wago, University of Toyama, "On Productivity Change: Case Study of the Prewar Japanese Cotton Industry"

Discussants: Masahiro Kurdoda, Keio University, and Hun-Young Yun, Yonsei University

Jisoon Lee, Seoul National University, "Optimal Magnitude and Composition of Government Spending"

Discussants: C. J. Lee, Chung-Hua Institution for Economic Research, and Kazuo Mino, Tohoku University

Kenn Ariga, Tokyo University; Giorgio Brunello, University of Venice; Yasushi Ohkusa; and Yoshihiko Nishiyama, Kyoto University, "Growth, Promotions, and Investment in Firm-Specific Human Capital"

Discussants: Konosuke Odaka, Hitotsubashi University, and Keijiro Ohtsuka, Tokyo Metropolitan University

Barro and Sala-i-Martin use datasets on 47 prefectures in Japan and 48 U.S. states and find convergence in both countries: that is, poor prefectures and states grow faster than rich ones. They also find convergence within regions as well as between regions. Further, in both countries, population adjusts slowly but significantly to income differentials. But there is little evidence that population movements explain convergence across states or prefectures.

Matsuyama models the difficulty in achieving growth through coordination across industries and spontaneous responses by creative entrepreneurs. He suggests that there is a level of "critical minimum effort," below which growth does not occur, and above which it does. This level is a function of the degree of inertia and the market

size. This model may explain why some economies are caught in poverty traps while others escape and achieve successful "take-offs."

Levine constructs a model in which financial intermediaries arise in response to economic conditions, and examines how the financial services provided by these intermediaries affect steady-state growth. He finds that the overall size of the financial system frequently is not related to growth. But which financial institutions are doing the intermediation, and to whom the financial system is allocating credit, are significantly correlated with growth over subsequent periods.

Cohen examines the effects of free access to world financial markets on the pattern of growth of a small country. In his model, growth in both closed and open economies is driven by the accumulation of human capital. A "poor" country, which gets new access to world financial markets, may speed up the accumulation of physical capital, but only if it is *relatively* poor in physical rather than human capital.

Saint-Paul and Verdier ask why countries with high initial inequality tend to an unequal, "conflictual" long-run equilibrium while countries with low initial inequality tend to a homogenous, nonconflictual long-run equilibrium. Public education has a direct redistributive role, and through the hereditary transmission of human capital, also tends to make income distribution more even in the long run. Which equilibrium eventually is reached depends entirely on the initial distribution of income: if it is relatively unequal, the economy will converge toward the conflictual equilibrium; if it is not, it will converge toward the egalitarian equilibrium.

Using monthly data on the prewar Japanese cotton industry, Yoshikawa, Okazaki, and Wago examine the relationship between productivity change and cyclical fluctuations. They find that productivity growth very often is procyclical. However, procyclical fluctuations in total factor productivity disappear entirely when data are adjusted for utilization rates. Also, there is no sign of intertemporal substitution in labor supply. Procyclical fluctuations in productivity are caused mostly by changes in the factor utilization rate, which in turn are induced by changes in demand. Cyclical fluctuation from pure technological shocks is minor.

Lee finds that the optimal fiscal spending rules are of two distinct types: one is characterized by a large share of total government spending in GDP, used mainly for income transfers; the other is characterized by a small share of government spending, largely devoted to public investments. The former is associated with low economic growth rates, while the latter is associated with high growth rates.

Ariga, Brunello, Ohkusa, and Nishiyama find that the incentive systems and the hierarchical structures of large Japanese firms are highly sensitive to the long-run growth rates of these firms. The key incentive in inducing employees' efforts is the expected gains from promotion.

These papers will be published in the *Journal of the Japanese and International Economies*.

Economics of the Family

Economists from the United States and Japan gathered in Oiso, Japan, on January 22–24 for a conference on the “Economics of the Family.” The conference, co-sponsored by the NBER and the Japan Center for Economic Research (JCER), was organized by David E. Bloom, NBER and Columbia University. The program was:

Sanders D. Korenman, NBER and Princeton University, and Barbara S. Okun, Princeton University, “Recent Changes in Fertility Rates in the United States: The End of the ‘Birth Dearth’?”

Discussant: Yukio Noguchi, Hitotsubashi University

Robert Dekle, Boston University; Shuichi Hirata and Sachiko Imada, Japan Institute of Labor; and Seiritsu Ogura, JCER, “Explaining Declining Fertility in Japan in the 1970s and 1980s: An Economic Approach and a Sociological Approach”

Discussant: David E. Bloom

Laurence J. Kotlikoff, NBER and Boston University, “Economic Exchange and Support within U.S. Families”

Discussant: Charles Y. Horioka, Osaka University

Yukio Noguchi, “The Role of Families in Intergenerational Transfers: An Analysis of Survey Data in Japan”

Discussant: Laurence J. Kotlikoff

Yoshio Higuchi, Keio University, and Hiromichi Mutoh, JCER, “The Cost of Children and Intergenerational Income Transfers Through Education in Japan”

Discussant: Toshiaki Tachibanaki, Kyoto University

Melissa Binder, Columbia University, and David E. Bloom, “Foregone Economies of Scale: The Aggregate Cost of Recent Changes in the Formation and Stability of U.S. Households”

Discussant: Hiromichi Mutoh

David T. Ellwood, NBER and Harvard University, “The Changing Structure of American Families: How Have They Changed, Why Have They Changed, and What Do the Changes Mean for Public Policy?”

Discussant: Toshiaki Tachibanaki

Noriyuki Takayama, Hitotsubashi University, “Labor Force Participation of Married Japanese Women in the Family Context”

Discussant: Sanders D. Korenman

Eiko Shinotsuka, Ochanomizu University, and Naohiro Yashiro, JCER, “The Family as a Unit of Japan’s Public Policies, with Specific Reference to Female-Headed Households”

Discussant: David T. Ellwood

The total fertility rate for the United States, unlike Japan’s, began to rise in 1987 and is estimated to have reached the replacement level of 2.1 in 1990. The total number of births also is increasing and has nearly reached the peak level of the baby boom years. Korenman and

Okun report that recent changes in U.S. fertility are not the result of delayed childbearing alone. Young women who already have a family are tending to have more children. The fertility rate also is rising for previously childless women with higher education. Finally, there has been a substantial rise in fertility among never-married women at all levels of education.

Dekle, Hirata, Imada, and Ogura explore the causes of the fertility decline in Japan. They find that an increase in female wage rates and a rise in women’s educational attainment have decreased women’s probability of marriage, thus depressing the fertility rate. In addition, higher land prices and house rents have had significant negative impacts on fertility.

Kotlikoff notes that economic exchange and support within families are probably at their lowest point in U.S. history. This fact has implications for the U.S. economy and for public policy. For example, the growing number of children in single-parent families may lead to a decline in the educational attainment of the labor force in the future. Further, if the propensity to bequeath is declining because of the provision of annuities and the deterioration of family ties, then there may be a significant impact on U.S. saving.

To study inheritance, Noguchi surveys families in the Greater Tokyo metropolitan area and in the traditional city of Yamagata. He finds that, despite the provision in the Civil Code after World War II, primogeniture is still common in rural Japan: the eldest son inherits most of the physical assets, while the other sons receive “education” as compensation, and migrate to large cities. However, the importance of inheritance also is increasing in urban areas, where rising land prices create barriers to homeownership.

Higuchi and Mutoh estimate that in 1989 the cost to a Japanese household of raising children was approximately 30 percent of total consumption expenditures, including imputed rent. Then, using data on the relative difficulty of entrance examinations, they ask how parental income affects children’s entrance into a university and the children’s subsequent lifetime income. They find that intergenerational income transfers through education are possible in Japan.

The average number of persons per U.S. household dropped from 3.1 to 2.6 between 1970 and 1990. Binder and Bloom try to measure the aggregate resource burden of these changes in household size and structure in order to estimate the economies of scale that have been foregone in the past two decades. They find that per-adult costs increased by 6–9 percent during this period.

Ellwood notes that an increasing proportion of U.S. children are raised in single-parent households. For blacks, this is the result of dramatic declines in marriage and in the childbearing of married women. For whites, increases in divorce and separation have been the critical factors, Ellwood finds. For children of both races, the increased proportion of single-parent households has worsened their economic position.

Using data on married Japanese women from the 1984

National Survey of Family Income and Expenditure, Takayama shows that the higher her husband's income, the more likely a woman is to be a full-time housewife. In addition, mothers of infants are not likely to be in the labor market. On the other hand, the wife's probability of labor force participation increases if she lives with her mother or mother-in-law, if the household has a mortgage, and if women's wages rise.

Shinotsuka and Yashiro observe that Japan's public policy is still based on a traditional view of the family in which the husband works and the wife is a homemaker. Many female-headed families, products of divorce, are not covered by the Income Maintenance Program, even if they are below the poverty line. On the other hand, full-time housewives receive tax subsidies and substantial social security benefits with no additional premiums. This leads to unintended income transfers from other types of families, resulting in distortions in both resource allocation and income distribution.

Also participating in this conference were JCER economists Shuichi Hirata, Makoto Kawamura, Yutaka Kosai, Akiko Oishi, and Katsuhide Takahashi. 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*.

The Political Economy of International Market Access

The NBER held a conference on "The Political Economy of International Market Access" in Cambridge on February 7-8. Robert E. Baldwin, NBER and University of Wisconsin; Douglas Nelson, Syracuse University; and J. David Richardson, NBER and Syracuse University, organized the following program:

Thomas O. Bayard and Kimberly A. Elliott, Institute for International Economics, "'Aggressive Unilateralism' and Section 301: Market Opening or Market Closing?"

Discussant: Joseph Francois, International Trade Commission

Michael Mastanduno, Dartmouth College, "Setting Market Access Priorities: The Use of Super 301 in U.S. Trade with Japan"

Discussant: Robert E. Baldwin

John S. Odell, University of Southern California, "International Threats and Internal Politics: Brazil, the European Community, and the United States, 1985-87"

Discussant: Michael Moore, George Washington University

Stefanie Ann Lenway, John S. Hughes, and Judy Rayburn, "Stock Price Effects of U.S. Trade Policy

Responses to Japanese Trading Practices in Semiconductors"

Discussant: Rachel McCulloch, NBER and Brandeis University

Bernard Hoekman, General Agreement on Tariffs and Trade, "Market Access and Multilateral Trade Agreements: The Uruguay Round Services Negotiations"

Discussant: Jeffrey Frieden, University of California, Los Angeles

Jeffrey Hart, Indiana University, "The Use of R and D Consortia As Market Barriers: Case Studies of High-Definition Television Consortia in Japan and Western Europe"

Discussant: Mordechai Kreinin, Michigan State University

Bayard and Elliott analyze all completed section 301 cases investigated since 1975. They show that retaliation by the United States has been rare, and that counterretaliation has been even rarer (only one case). Their results indicate that section 301 has led to at least partial market opening in just over half of the total cases investigated, and in about two-thirds of the cases investigated since 1985. These relatively modest results suggest that fans of section 301 overrate it, while its critics exaggerate its evils.

Mastanduno asks how and why the Bush administration selected its "Super 301" priority practices in trade with Japan during 1989. He concludes that no single hypothesis adequately explains the pattern of designations and rejections that eventually resulted in the selection of satellites, supercomputers, and wood products. Rather, both strategic trade concerns and the preferences of U.S. industry and the U.S. Congress weighed heavily. Less important were the potential impact of market opening on the U.S. trade deficit, the ability to resolve trade disputes easily, and U.S. multilateral objectives.

Odell studies two episodes of the United States using threats of retaliation to change other governments' economic policies. He finds that domestic opposition to carrying out the threat will undermine its credibility abroad, reducing the likelihood of compliance, even if the consequences of implementation are severe. Second, even in the face of a credible threat, the target government is less likely to comply if the net domestic political cost of doing so exceeds the political cost of no agreement. Because both of these domestic obstacles were present during the Reagan administration's coercive attempt against Brazil in 1985, there was less compliance by Brazil than by the European Community in a simultaneous effort, even though Brazil appeared to be in a much weaker general position.

Over much of the last decade, the United States and Japan have been embroiled in a trade dispute over access to Japanese markets for semiconductors and downstream products. Lenway, Hughes, and Rayburn examine the reactions of stock prices of affected firms to a set of events, commencing with the filing of a section 301 petition by the U.S. Semiconductor Industry Associ-

ation alleging unfair practices by the Japanese, and culminating in the 1986 Trade Agreement. They argue that U.S. semiconductor buyers, as well as producers, benefited from these events.

During the Uruguay Round, market access emerged as a specific obligation of the signatories of the General Agreement on Trade in Services (GATS). Hoekman discusses the meaning of market access in the GATS context, the role of interest groups in determining the structure of the agreement, and the extent to which GATS is likely to effectively increase access to service markets. He concludes that much will depend on the wording of incomplete provisions, and on the evolution of the coverage of the agreement.

Hart discusses three cases of using R and D consortiums as barriers to trade and investment in the field of high-definition television (HDTV): the European Eureka EU95 program; the European Vision 1250 program; and NHK Engineering Services in Japan. HDTV has been made a priority for public R and D efforts in both Europe and Japan, because their governments believe that the technologies underlying HDTV will be critical for competition in high technology electronics. The governments and the European Community used R and D consortiums to pool the risks of the development of new technologies. Access to full membership in these consortiums in both regions is limited to firms owned and headquartered in the region. Access to the technology created is limited in a variety of ways, the most important of which is the inability to work with the technologies themselves at an early stage, thus denying nonmembers the possibility of participating in the design of new products.

Also participating in this conference were: Geoffrey Carliner, NBER; J. Michael Finger, World Bank; Stephan Haggard, Harvard University; Robert Z. Lawrence, NBER and Harvard University; Pietro Nivola, Brookings Institution; Marcus Noland, Institute for International Economics; Seamus O'Cleireacain, Ford Foundation; and Gilbert R. Winham, Dalhousie University.

Second Annual U.S.–Japan Economic Forum

The second annual U.S.–Japan Economic Forum, organized by Martin Feldstein, NBER and Harvard University, and Yutaka Kosai, Japan Center for Economic Research (JCER), took place on February 13–14. This meeting brought together 30 U.S. and Japanese executives with a smaller group of academic economists. The program, consisting of background papers written by NBER and JCER economists and less formal presentations by corporate executives, was:

Government–Business Relations in the United States and Japan

Panelists: Masaaki Morita, Sony Corporation of America; Ken Moroi, Chichibu Cement; Randall L. Tobias, AT&T; and James Unruh, UNISYS

Background Papers: Masahiro Okuno, University of Tokyo, "The Japanese Government's Relationship with Industry," and Lawrence J. White, New York University, "Government–Business Relations in the United States in the 1980s"

Corporate Governance

Panelists: Joseph T. Gorman, TRW; Yotaro Kobayashi, Fuji Xerox Company; and Jiro Ushio, Ushio, Inc.

Background Papers: Jay O. Light, Harvard University, "The American System of Corporate Governance," and Hiroataka Takeuchi, Hitotsubashi University, "The Japanese System of Corporate Governance: Will Stakeholders Remain Silent?"

U.S.–Japan Trade Imbalances

Panelists: John Carlson, Cray Research; Minoru Makihara, Mitsubishi International Corporation; Lionel H. Olmer, Paul, Weiss, Rifkind, Wharton, and Garrison; and Yoshio Suzuki, Nomura Research Institute

Background Papers: Kenneth A. Froot, NBER and Harvard Business School, "U.S.–Japan Trade Developments," and Iwao Nakatani, Osaka University, "The Asymmetry of the Japanese-Style versus American-Style Capitalism as the Fundamental Source of the Japan–U.S. Imbalance Problems"

U.S.–Japan Relations in the Asia–Pacific Region

Panelists: Paul Allaire, Xerox Corporation; A. W. Clausen, BankAmerica Corporation; Masashi Kojima, Nippon Telegraph and Telephone; and Tadao Suzuki, Mercian

Background Papers: Anne O. Krueger, NBER and Duke University, "Japanese and American Trade and Investment Relations with Other East Asian Countries," and Toshio Watanabe, Tokyo Institute of Technology, "Western Pacific Region Development and China-Replicated Structural Conversions"

International Order After the Cold War: U.S. and Japanese Roles

Panelists: Thomas H. Kean, Drew University (formerly governor of New Jersey), and Terumasa Nakanishi, Shizuoka Prefectural University

Morita suggested that the American and Japanese governments should not focus on the nationality of companies. For example, Sony America has three major R and D facilities and ten manufacturing plants in the United States. Moroi pointed out that the Japanese government continues to support the corporations in order to nurture and strengthen them. Tobias observed that in the United States, it is consumer interests that are important: for example, prior to the 1970s, AT&T had a monopoly in the telephone business, but the government forced the breakup of the company. Unruh stressed that governments should help business not by managed

managed trade, but by investing in public infrastructure and by ensuring open trade and market access.

Okuno contrasted Japan's government-corporate relationships with those in the United States. The Japanese government-business system guarantees stability and efficiency for insiders, but excludes consumers and outsiders. In the United States, the system is transparent, follows clear rules, and makes no distinctions between insiders and outsiders. However, the U.S. style of administration may lack flexibility. White showed that in the United States during the 1980s, there was substantial deregulation in such sectors as telecommunications and fuel pricing. But the 1980s were characterized by a significant increase in restrictions on U.S. imports.

Gorman predicted that corporate governance will be influenced increasingly by the managers of pension funds. By the year 2000, pension funds will hold up to 50 percent of the value of the New York Stock Exchange, he believes. Kobayashi suggested that a typical Japanese company's board of directors is too inbred; more outsiders should be brought in. Ushio observed that the rapid growth in Japanese corporate profits in the late 1980s may have reduced the cohesion between management and workers. The authority of top management grew, but middle managers and workers did not share in the increase in profits.

Light added that in ordinary times, the American firm's CEO and top management team have a great deal of freedom to pursue their own vision and agenda. In times of crisis, though, such as financial distress or a hostile takeover attempt, the corporation can be affected profoundly by the demands of external constituencies, including shareholders who demand higher short-term stock prices, or lenders who demand greater short-term cash flows. Takeuchi pointed out that the Japanese system of corporate governance had been highly effective in coordinating the activities of various stakeholders and in resolving their conflicting interests.

Carlson predicted that, in the future, the size of a country's trade balance will be less important. Far more crucial will be the nation's technological, marketing, and management skills. Makiyama pointed out that, to be successful, Japanese exporters require a large domestic subcontracting sector. In the future, the ties between exporters and subcontractors are bound to weaken. Olmer explained that U.S. imports from Japan consist primarily of imports by Japanese companies located in the United States, and imports by U.S. companies from associated firms. In 1990, Japan's \$83.5 billion direct investment in the United States was responsible for employing over 500,000 workers and generating more than \$20 billion in salaries. Yoshio Suzuki expressed concern about managed trade and regionalism: "voluntary import expansions" by Japan would be very costly, since they would force domestic firms to change their basic structure. Further, Japan should not create a third bloc to counter the Europeans and the possible free trade area in the Western Hemisphere.

Froot then demonstrated that, by most measures of

trade, Japan's economy is quite closed. Although imported manufactures are rising at a very rapid rate, they still remain low by international standards. Nakatani suggested that U.S.-Japan trade conflicts arise because the two countries' economic systems are fundamentally different: the basic concept of American-style capitalism is "markets," while the basic concept behind Japanese-style capitalism is "networks."

Allaire believes that, despite Japan's overwhelming economic presence in the Asia-Pacific region, there is still room for U.S. companies to enter. Clausen argued that the United States will continue to be a major political, military, and economic power in Asia, even though U.S. influence in the region will decline and Japanese power will grow. Kojima observed that East and Southeast Asian economic development depends on U.S. and Japanese trade, investment, and foreign aid. For example, exports to the United States and Japan account for almost 50 percent of total ASEAN exports. Tadao Suzuki cautioned that Japan should not join an Asian free trade area. Rather, free trade eventually should encompass all of the world's industrialized countries, including the European Community.

Krueger noted that the share of the other East Asian countries in the global trade of the United States and Japan is relatively small. Because of the size of the United States and Japan, the relationship is asymmetric. Other East Asian countries have a significant portion of their trade and direct foreign investment with the United States and Japan. Watanabe summarized the structural changes that have occurred among the Western Pacific developing countries since the appreciation of the yen in 1985. He showed that the economies responded swiftly to the high yen by expanding their exports to Japan and the United States. As a result, they were able to achieve high rates of economic growth.

Kean pointed out that U.S.-Japan cooperation will be increasingly important in promoting democracy and in stopping Third World aggressors, such as Iraq. Despite cultural differences, the United States and Japan have common interests in promoting market economies. Nakanishi argued that the New World Order is characterized by multipolarity. As the Soviet Union breaks up, economic blocs are emerging. Regionally, Japan's role is to prevent arms proliferation and local wars; globally, Japan should maintain free trade, promote democracy, and help to solve refugee and environmental problems.

Other participants in the U.S.-Japan Economic Forum were: Takashi Imai, Nippon Steel; Shoichiro Irimajiri, Honda Motor Company; Kinichi Kadono, Toshiba Corporation; John Makin, U.S.-Japan Friendship Committee; Yoshihiko Miyauchi, ORIX; Yuzaburo Mogi, Kikkoman Company; James Montgomery, Great Western Financial Corporation; Junichi Murata, Murata Machinery; Takahiro Okada, JCER; Tasuku Takagaki, Bank of Tokyo; Tatsuhiro Toyoda, Toyota Motor Corporation; and Tadashi Yamamoto, Japan Center for International Exchange.

This article was prepared with the assistance of Robert Dekle, Boston University. These conference proceed-

ceedings will be published in English and Japanese. Their availability will be announced in a future issue of the *NBER Reporter*.

Behavioral Economics and Finance

The NBER, with financial support from the Russell Sage Foundation, convened a working group on "Behavioral Economics and Finance" in Cambridge on February 21. Robert J. Shiller, NBER and Yale University, and Richard Thaler, NBER and Cornell University, organized the day's agenda:

Josef Lakonishok, University of Illinois at Urbana-Champaign; Andrei Shleifer, NBER and Harvard University; and Robert W. Vishny, NBER and University of Chicago, "The Structure and Performance of the Money Management Industry"

Discussant: Jeremy C. Stein, NBER and MIT

Charles M. C. Lee and Paul J. Seguin, University of Michigan, and Mark Ready, University of Wisconsin, "Volume, Volatility, and NYSE Trading Halts"

Discussant: David M. Cutler, NBER and Harvard University

Karl Case, Wellesley College; Robert J. Shiller; and Allan Weiss, CSW, Inc., "Index-Based Futures and Options Markets in Real Estate"

Discussant: James M. Poterba, NBER and MIT

J. Bradford De Long, NBER and Harvard University, and Marco Becht, European University Institute, "'Excess Volatility' and the German Stock Market, 1876-1990"

Discussant: Werner De Bondt, University of Wisconsin

Drazen Prelec, MIT, and George Loewenstein, Carnegie-Mellon University, "Preferences for Sequences of Outcomes"

Discussant: John Pratt, Harvard University

Peter Diamond, NBER and MIT; Drazen Prelec; Eldar Shafir, Princeton University; and Amos Tversky, Stanford University, "On Money Illusion"

Discussant: Richard Thaler

Lakonishok, Shleifer, and Vishny describe the money management industry as performing poorly, although with some long-run consistency. They find that money managers underperform the S&P 500 by 100-200 basis points. The authors conclude that the industry continues to exist because it provides corporations with product differentiation and service ("schmoozing").

Lee, Seguin, and Ready find that a halt in trading increases, rather than decreases, trading volume and price volatility. Volume in the first full day (6.5 trading hours) after a halt is 570 percent higher than it is during average periods. These results are true for different

types of trading halts and news events. The authors conclude that increased speculative trading, perhaps because of broader media coverage, is an important determinant of volume and volatility following major news events.

Case, Shiller, and Weiss suggest that the establishment of markets in cash-settled futures and options on real estate might reduce obstacles to diversification and hedging in real estate. Related institutions, such as home equity insurance, might develop around these futures and options markets. Establishment of these markets is likely to increase the quantity of reproducible real estate, and to lower rents on real estate. It also may reduce the amplitude of speculative real estate price movements and dampen the business cycle.

De Long and Becht use long-run real price and dividend data to search for "excess volatility" in the German stock market. They find no evidence of excess volatility in the German stock market before World War I, but some evidence of excess volatility after World War II. The role played by the German *Großbanken* in the pre-World War I stock market might explain the low comparative volatility of German stock indexes before 1914.

Prelec and Loewenstein show important differences between preferences for single outcomes and for sequences of outcomes. While people discount single outcomes in a fairly conventional manner, they generally prefer sequences that improve over time, as if they discount the future negatively. People also seek to spread outcomes evenly over time in a way that violates additive separability.

Diamond, Prelec, Shafir, and Tversky describe some initial experimental investigations into the psychology that underlies "money illusion." Money illusion describes people's failure to recognize that the value of money varies because of interest rates and inflation. The assumption of money illusion, while important in economic theorizing, implies a lack of rationality by economic agents that is alien to many economists.

Also attending this workshop were: Lawrence Ausubel, Northwestern University; François Degeorge, Harvard University; Kenneth A. Froot and Richard J. Zeckhauser, NBER and Harvard University; and Kent Womack, Cornell University.

The Transition in Eastern Europe

Over 80 economists, journalists, and policymakers from throughout the United States and Europe gathered in Cambridge on February 26-29 for a conference on "The Transition in Eastern Europe." Olivier J. Blanchard, NBER and MIT, and Kenneth A. Froot and Jeffrey D. Sachs, NBER and Harvard University, organized the following program:

Karel Dyba, Minister of Economics, Czechoslovakia, and Jan Svejnar, University of Pittsburgh, "Stabilization and Transition in Czechoslovakia"
 Discussant: David Begg, Birkbeck College

Andrew Berg, MIT, and Olivier J. Blanchard, "Stabilization and Transition: Poland 1990-1"
 Discussant: Mark Schaffer, London School of Economics

Kemal Dervis and Timothy Condon, World Bank, "Hungary: An Emerging Gradualist Success Story?"
 Discussant: Kalman Miszei, Hungarian Academy of Sciences

Jeffrey D. Sachs, and Boris Pleskovic, Advisor to the Prime Minister of Slovenia, "Slovenia"
 Discussant: Saul Estrin, London School of Economics

Stanley Fischer, NBER and MIT, "Russia and the Soviet Union Then and Now"
 Discussant: Lawrence H. Summers, NBER and World Bank

Rudiger Dornbusch, NBER and MIT, and Holger C. Wolf, MIT, "East German Economic Reconstruction"
 Discussants: Johannes Ludewig, Federal Chancellery, Germany, and Janet Yellen, University of California, Berkeley

Roger H. Gordon, NBER and University of Michigan, "Fiscal Policy During the Transition in Eastern Europe"
 Discussant: Barry Bosworth, Brookings Institution

Peter A. Diamond, NBER and MIT, "Pension Reform in a Transition Economy: Notes on Poland and Chile"
 Discussant: George Kopits, IMF

Richard Jackman, Richard Layard, and Andrew Scott, London School of Economics, "Unemployment in Eastern Europe"
 Discussant: Fabrizio Coricelli, World Bank

Richard B. Freeman, NBER and Harvard University, "What Direction for Labor Market Institutions in Eastern and Central Europe?"
 Discussant: Anthony Levitas, Harvard University

Philippe Aghion, DELTA Institute; Oliver Hart, NBER and MIT; and John Moore, London School of Economics, "The Economics of Bankruptcy Reform"
 Discussant: Jeremy C. Stein, NBER and MIT

Dani Rodrik, NBER and Harvard University, "Foreign Trade in Eastern Europe's Transition: Early Results"
 Discussant: Susan M. Collins, NBER and Harvard University

Andrei Shleifer, NBER and Harvard University, and Robert W. Vishny, NBER and University of Chicago, "Privatization in Russia: First Steps"
 Discussant: Jacek Rostowski, University of London

Simon Johnson, Duke University, "Private Business in Eastern Europe"
 Discussant: Kalman Miszei

Andrew Berg, "Logistics of Privatization"
 Discussant: Thomas Kolaja, Ministry of Finance, Poland

David Lipton, Jeffrey D. Sachs and Associates, "Budgetary Effects of Poland's Economic Transformation"
 Discussant: Michael Dooley, University of California, Santa Cruz

Wendy Carlin, University College, London, and Colin Mayer, City University Business School, London, "The Treuhandanstalt: Privatization by State and Market"
 Discussant: Wilhelm Nolling, Landescentralbank, Hamburg

Kenneth A. Froot, "Foreign Direct Investment in Eastern Europe: Some Economic Considerations"
 Discussant: Pentti Kouri, Kouri Capital

Dyba and Svejnar report that price stability followed within three to six months the sudden liberalization of 85 percent of all Czechoslovak prices on New Year's Day 1991. The private sector responded quickly, especially with increased exports to the West. However, the post-reform recession has been deeper than anticipated, in part because trade with the former CMEA countries collapsed unexpectedly. Dyba and Svejnar attribute the economic success so far to the political support of the Czech and Slovak peoples, but they caution that the privatization of large state enterprises will be difficult.

Since stabilization and liberalization of prices and trade in January 1990, Poland has been affected by two large adverse shocks. The first, in early 1990, was primarily a demand shock associated with the end of the hyperinflation. The second shock, in early 1991, was caused by the collapse of CMEA trade. According to Berg and Blanchard, those shocks have shaped the process of transition. State firms, which had a lot of adjustment to do, have not adjusted well. In contrast, the private sector has grown rapidly, although from a narrow base.

Dervis and Condon discuss the strategy that helped Hungary to overcome a near-liquidity crisis that emerged in 1990 and ended in mid-1991. They then analyze developments in the economy—including output and export performance, the rise in savings and foreign direct investment, and the experience with privatization—for signs that would justify the optimism regarding Hungary's prospects.

Sachs and Pleskovic review recent Slovenian steps toward economic reform. They emphasize that the replacement of the Yugoslav dinar by Slovenian currency proceeded smoothly because Slovenian authorities took dinars out of circulation following the monetary reform. Furthermore, cash balances were very low because of the hyperinflation that occurred during the preceding year. Sachs and Pleskovic also describe the difficulties of privatization when managers of state enterprises and banks have much economic and political power.

Fischer retraces Russian and Soviet economic history since 1861, and analyzes the reform problems now facing the former Soviet republics. He examines the period from 1913 to 1928, during which the Bolshevik government dealt with some problems that are similar to those

today. He then discusses in greater detail the causes of the growth slowdown that lasted until 1985 and the collapse under Gorbachev. He concludes by describing the current economic situation, reform prospects, and problems facing Russia and the other republics.

Dornbusch and Wolf identify a combination of adverse supply and demand shocks—in particular, the overnight abolition of trade barriers, coupled with income transfers and wage increases far in excess of productivity gains—as the main causes of the current recession in eastern Germany. They note that while privatization has been quite successful, there is an increasing tendency to cement existing industrial structures in order to protect employment. They expect sizable productivity convergence in the next decade, assisted decisively by massive transfers from western Germany.

Gordon notes that the countries in Eastern Europe began the transition process with highly distortionary fiscal structures. Economic reforms now allow firms to respond to these distorted incentives, which results in large efficiency losses and declines in tax revenue. Without thorough tax reform, the entire economic reform process is likely to fail. Well-designed fiscal policies could lessen the cost of firms facing bankruptcy, of workers being unemployed, and of entrepreneurs seeking credit.

Diamond explores proposals to change the Polish pension system, and discusses lessons from Chile's system of individual retirement accounts. Among the issues he addresses are: incentives and insurance aspects of pensions; the distribution of pensions; the aggregate budget for pensions, and questions about funding, including the intertemporal pattern of consumption cuts to finance benefits; the effect of funding on other government expenditures and on the politics of pension determination; the role of regulation if funds are privatized; and the possible roles of pension funds in the privatization of firms and in the development of the capital market.

Jackman, Layard, and Scott try to explain the large rise in unemployment and falls in real wages that have occurred during the transition in Czechoslovakia, Hungary, and Poland. They suggest that the extraordinary events of the last few years are a product of large shocks rather than institutional structure. The labor markets of Eastern Europe operate similarly to those of the OECD, they conclude.

Freeman finds that labor market institutions have been surprisingly stable in Poland, Hungary, and Czechoslovakia during the initial phase of market reforms, while labor market outcomes have changed dramatically. The former official trade unions continue to represent workers; central governments use taxes to limit wage increases and reduce real wages; and governments use tripartite forums to seek consensus on labor issues. Even without privatization, state-owned enterprises have reduced employment in all three countries and have changed relative wages in Hungary and Poland.

Aghion, Hart, and Moore describe a new bankruptcy procedure for Eastern Europe. Initially, a firm's debts would be canceled, and cash and noncash bids solicited for the "new" (all-equity) firm. Former claimants would be given shares, or options to buy shares, in the new firm on the basis of absolute priority. Options could be exercised once the bids were in. Finally, a shareholder vote would determine the selection of bids. This procedure differs from U.S. Chapter 7 in that it allows for reorganization. It is simpler and quicker than Chapter 11, is market-based, avoids conflicts, and places appropriate discipline on management.

Rodrik notes that, by the end of 1991, Czechoslovakia, Hungary, and Poland had achieved a substantial degree of openness to foreign trade. Export performance was impressive in all three countries, and import booms were underway in Hungary and Poland. However, Rodrik reports that exporters have had little success in finding western markets for the products that they used to export to Eastern European markets.

Shleifer and Vishny describe the Russian privatization program as of January 1992. There are many conflicting potential ownership claims on the Russian companies, including those of workers, managers, ministries, and local governments, as well as those of the central government. Any politically and economically feasible privatization program must reconcile these claims rather than exclude any of the stakeholders. The Russian program attempts to be extremely generous to all the relevant stakeholders, but its success is not guaranteed.

Johnson reports that the private sectors in Hungary and Poland have grown rapidly since reforms began, not only in wholesale and retail sectors, but also in small-scale manufacturing and construction. Private business is significantly less developed in the Czech and Slovak Republics than in either Hungary or Poland, he finds. This difference is hard to attribute to current government policy in these countries, and is more plausibly a result of their previous experiences with economic reform.

Berg reviews privatization efforts to date and isolates some of the reasons for the slow progress. The most important constraint has been the existing pattern of ownership rights. Traditional methods of privatization, such as initial public offerings, have been very slow, while approaches that incorporate these preexisting claims more carefully have had the most success.

Lipton describes the Polish budget deficit as a potential hindrance to economic reform. Between 1987 and 1991, government subsidies for state enterprises in Poland fell from 5.9 percent to 1.8 percent of GDP. Subsidies to households for food, housing, fuels, and other goods fell from 10 percent to 2 percent of GDP. But revenues from a turnover tax on firms and an income tax on individuals also fell, from 22 percent of GDP to 13 percent. After a period of large deficits in 1987–9, Poland had a budget surplus of 0.6 percent of GDP in 1990, but in 1991 its deficit rose to 3.3 percent of GDP.

Carlin and Mayer note that the Treuhandanstalt (THA) has adopted policies for privatizing eastern Germany's state enterprises that would have been impossible without massive assistance from the German federal government. The THA also has relied heavily on the expertise of business managers and civil servants from western Germany in formulating these policies. But providing large subsidies to private buyers in exchange for their guarantees to maintain employment and make investments is not feasible in other former East Bloc countries.

Foreigners find it very costly to explore business possibilities, and to learn how to do business, in Eastern Europe. Therefore, it is hard to generate foreign competition for the assets up for sale. Froot traces Poland's experience with various institutional frameworks designed to minimize the costs of doing business there. In addition, he considers several auction schemes designed to improve host-country bargaining power in selling to foreigners.

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

Conference Calendar

Each *NBER Reporter* includes a calendar of upcoming conferences and other meetings that are of interest to large numbers of economists (especially in academia) or to smaller groups of economists concentrated in certain fields (such as labor, taxation, finance). The calendar is intended primarily to assist those who plan conferences and meetings, to avoid conflicts. **All activities listed should be considered to be "by invitation only," except where indicated otherwise in footnotes.** Organizations wishing to have meetings listed in the Conference Calendar should send information, comparable to that given below, to Conference Calendar, National Bureau of Economic Research, 1050 Massachusetts Avenue, Cambridge, MA 02138. Please also provide a short (fewer than fifty words) description of the meetings for use in determining whether listings are appropriate for inclusion. The deadline for receipt of material to be included in the Summer 1992 issue of the *Reporter* is June 1. If you have any questions about procedures for submitting materials for the calendar, please call Kirsten Foss Davis at (617) 868-3900.

May 15, 1992

Foreign Direct Investment, NBER

June 5, 1992

Conference on Research in Income and Wealth: Workshop on Measurement of Depreciation and Capital Stock, NBER

June 11-13, 1992

Transatlantic Public Economics Symposium, NBER

June 15-16, 1992

International Seminar on Macroeconomics, NBER (with the European Economic Association and La Maison des Sciences de l'Homme)

June 16-20, 1992

Third Annual Asian Seminar on Economics, NBER (with Korea Development Institute)

July 9-13, 1992

Sixty-Seventh Annual Conference: "The Expanding Domains of Economics," Western Economic Association*

July 10, 1992

Economic Fluctuations Meeting, NBER

September 13-16, 1992

Annual Meeting, National Association of Business Economists*

September 17-18, 1992

Panel on Economic Activity: Macroeconomics, Brookings Institution

October 23, 1992

Economic Fluctuations Meeting, NBER

October 23-24, 1992

Conference on Microeconomic History, NBER

October 30-31, 1992

Economic Growth, NBER

November 12-13, 1992

Program Meeting: Taxation, NBER

November 17, 1992

Tax Policy and the Economy, NBER

November 20-21, 1992

Political Economy, NBER

November 22-24, 1992

Annual Meeting, Southern Economic Association*

December 3-4, 1992

Growth and Stabilization in Latin America, NBER (with InterAmerican Development Bank)

January 21-24, 1993

Conference on Monetary Policy, NBER

February 5, 1993

Economic Fluctuations Research Meeting, NBER

February 17-20, 1993

U.S./Japan Economic Forum, NBER

March 18-21, 1993

International Savings, NBER

September 19-23, 1993

Annual Meeting, National Association of Business Economists*

*Open conference, subject to rules of the sponsoring organization.

NBER Research Associate Receives Clark Medal

Paul R. Krugman, a research associate in the NBER's Program in International Studies, was the 1991 recipient of the John Bates Clark Award from the American Economic Association. Krugman is known for his work on global trade and finance.

Krugman received his undergraduate degree from Yale University and his Ph.D. from MIT. He began his teaching career at Yale, and is now a professor of economics at MIT.

The Clark Medal is awarded every other year to the economist under the age of 40 who is judged to have made the most significant contribution to economics. Past recipients of the John Bates Clark Award who have been NBER researchers are: Research Associate Emeritus Milton Friedman, 1951; NBER Director Franklin M. Fisher, 1973; Research Associates Zvi Griliches, 1965, Daniel McFadden, 1975, Martin Feldstein, 1977, Joseph E. Stiglitz, 1979, A. Michael Spence, 1981, James J. Heckman, 1983, Jerry A. Hausman, 1985, Sanford J. Grossman, 1987; and former Research Associate Gary S. Becker, 1967.

Bureau Mourns Kravis

Irving B. Kravis, who was a research associate in the NBER's Program in International Studies, died in January while on his way to receive an award at the American Economic Association meetings in New Orleans. He was 75.

For 37 years, Kravis was on the faculty of the University of Pennsylvania, where he earned both his bachelor's and doctorate degrees. He chaired the economics department from 1955-8 and 1962-7, and was associate dean of the Wharton School from 1958-60.

During his long involvement with the NBER, Kravis did pioneering studies on price measurement, international competitiveness, and multinational corporations. He also had been a consultant to the Organization for European Common Development and to other foreign and U.S. agencies.

Over 30 members and guests of the NBER's Program in Industrial Organization met in Cambridge on December 6. Nancy L. Rose of the NBER and MIT organized the following agenda:

Nancy E. Ryan, University of British Columbia, "Rate-Base Determination in the Electric Utility Industry: An Empirical Analysis"

Amy L. Bertin, Harvard University; Timothy F. Bresnahan, NBER and Stanford University; and Daniel M. G. Raff, NBER and Harvard University, "Short-Run Increasing Returns Can Explain Procyclical Productivity: Depression-Era Blast Furnaces"

Garth Saloner and Andrea L. Shepard, NBER and Stanford University, "Strategic Adoption of Automated Teller Machines"

Severin Borenstein and A. Colin Cameron, University of California, Davis, and Richard Gilbert, University of California, Berkeley, "Asymmetric Retail Gasoline Price Responses to Crude Oil Price Changes"

David Weiman and Richard C. Levin, Yale University, "Preying for Monopoly: The Case of Southern Bell Telephone Company"

Ryan examines how nuclear power plants completed after 1979 (the year of the Three Mile Island accident) have been treated by public utility commissions (PUCs) in rate cases. A well-established legal principle, known as the prudent investment test, would deny utilities full recovery of their investments in these projects. However, drawing on existing research on the determinants of construction costs for nuclear plants, Ryan finds only a weak relationship between plant cost/performance and punishments by PUCs in terms of ratesetting. She also observes that although the basic format of rate-of-return regulation is the same throughout the United States, there is considerable variation across states in PUC ratesetting.

Bertin, Bresnahan, and Raff ask whether short-run increasing returns to labor can explain the procyclical labor productivity observed in the blast furnace industry from 1929-35. Using a plant-level dataset from the Census of Manufacturers, they estimate a short-run production function that includes operational indicators, such as how many furnaces are running. They find considerable increasing returns at multifurnace plants: moving a man-month from a single furnace plant to a multifurnace plant increases labor productivity by one-third. The reallocation of labor to plants operating at efficient scale explains 60 percent of procyclical labor productivity in 1931, and 40 percent in 1933 and 1935, they conclude.

Using bank-level data from the 1970s, and holding the number of branches and the size of deposits constant, Saloner and Shepard find that a higher market share

share leads a bank to adopt automated teller machines earlier than it would have otherwise. As a result, the adoption profile in a given market is more diffuse than would be expected based only on the number of branches and the absolute level of deposits: the largest banks in a market adopt earlier than the smaller banks do.

The 1990–1 Persian Gulf crisis once again focused attention on the response of retail gasoline prices to fluctuations in world oil prices. Borenstein, Cameron, and Gilbert confirm that gasoline prices react more quickly to increases than to decreases in crude oil prices. Transmittal of a price change from crude oil to retail gasoline often depends on the response in two or more intermediate margins at the refining and distribution levels, they observe. The asymmetry in price response occurs not at the refining level but downstream at the wholesale and retail levels, the authors conclude.

Using evidence from the Southern Bell Telephone Company (SBT), Weiman and Levin examine the “natural” origins of the Bell System’s monopoly over local phone service. They show that until 1900, SBT responded to entry by predatory pricing: slashing rates and enduring losses in competitive markets. When price cutting alone did not eliminate the competition, SBT consolidated its regional toll network through preemptive toll line construction, and the acquisition and sublicensing of independents at noncompetitive points. By the end of 1903, this strategy had isolated and fatally weakened the remaining independents. With one exception, these holdouts were acquired over the next decade.

Other participants in this meeting were: Steven T. Berry and Ariel Pakes, NBER and Yale University; Geoffrey Carliner, NBER; Dennis W. Carlton, NBER and University of Chicago; Richard E. Caves, Harvard University; Jonathan Feinstein and Frank A. Wolak, NBER and Stanford University; David J. Genesove, Princeton University; Ann Gron, University of Chicago; Bronwyn H. Hall, NBER and University of California, Berkeley; Adam B. Jaffe and Michael D. Whinston, NBER and Harvard University; Paul L. Joskow, Robert S. Pindyck, and Julio J. Rotemberg, NBER and MIT; Shulamit Kahn, NBER and Boston University; Daniel M. Kasper, Harbridge House, Inc.; Sarah J. Lane, Michael A. Salinger, and Martha Schary, Boston University; Robert H. Porter, NBER and Northwestern University; and Robin A. Praeger, Vanderbilt University.

Program Meeting on Corporate Finance

Members of the NBER’s Program in Corporate Finance met for the first time in Cambridge on January 31. Program Director Robert W. Vishny, NBER and University of Chicago, organized the following agenda:

Steven N. Kaplan, NBER and University of Chicago, “Internal Corporate Governance in Japan and the United States: Differences in Activity and Horizons”
Discussant: Krishna Palepu, Harvard University

Josef Lakonishok, University of Illinois at Urbana–Champaign, and David L. Ikenberry, Rice University, “Corporate Governance Through the Proxy Contest: Evidence and Implications”

Discussant: Mark Mitchell, University of Chicago

Kenneth A. Froot, NBER and Harvard University, and David S. Scharfstein and Jeremy C. Stein, NBER and MIT, “Risk Management: Coordinating Corporate Investment and Financing Policies”

Discussant: Raghuram Rajan, University of Chicago

Gary B. Gorton, NBER and University of Pennsylvania, and Richard Rosen, Federal Reserve Board, “Overcapacity and Exit from Banking”

Discussant: Anil K. Kashyap, University of Chicago

Oliver Hart, NBER and MIT, and John Moore, London School of Economics, “A Theory of Debt Based on the Inalienability of Human Capital” (NBER Working Paper No. 3906)

Discussant: Douglas Diamond, University of Chicago

Paul Asquith, MIT; Robert Gertner, University of Chicago; and David S. Scharfstein, “Anatomy of Financial Distress: An Examination of Junk-Bond Issuers” (NBER Working Paper No. 3942)

Discussant: Stuart Gilson, Harvard University

Kaplan finds much more frequent turnover among CEOs and top managers in Japan’s largest companies (by sales) than among their counterparts in the United States. Further, turnover of the top few managers is more strongly related to stock and earnings performance in Japan than in the United States, particularly over time. Appointments of corporate outsiders as top managers also are more strongly related to financial distress in Japan than in the United States. Finally, while the level of executive compensation is lower in Japan than in the United States, its relationship to stock performance is similar to that found for the United States in previous studies.

Using a sample of 97 corporate elections held between 1968 and 1987, Lakonishok and Ikenberry find negative returns and deteriorating operating performance prior to the announcement of such an election. Following the proxy contest, there are also negative returns, driven by cases of dissident shareholders successfully acquiring seats on the board of directors.

Froot, Scharfstein, and Stein observe that if external sources of finance are more costly to corporations than internally generated funds are, typically there will be a benefit to hedging. Hedging helps to ensure that a corporation has sufficient internal funds available to take advantage of attractive investment opportunities. The authors delineate how risk management strategies will depend on such factors as shocks to investment and financing opportunities. They also consider exchange

rate hedging strategies for multinationals, and strategies involving “nonlinear” instruments, such as options.

Gorton and Rosen note that, during the 1980s, nonbank competition for corporate finance eroded banks’ market share of short-term nonfinancial debt. With strong competitive, perhaps monopolistic, advantages in issuing insured debt, banks continued to lend during the 1980s, but took on unrewarded risk. Bank mergers during the period in general did not reduce total assets in banking. Significant agency costs, caused by the inability of outsiders to value banks and by a weak market for corporate control in banking, prevent shareholders from forcing bank management to shrink via slow growth, merger, or voluntary liquidation. Gorton and Rosen argue that managerial entrenchment, rather than deposit insurance, explains why the industry continues to grow, leaving failure as the only channel for exit.

Hart and Moore consider an entrepreneur who needs to raise funds from an investor, but cannot commit to maintaining his human capital on the project. The possibility of a default, or quit, limits the total future indebtedness of the entrepreneur to the investor. The optimal repayment path is affected both by the maturity structure of the project’s return stream and by the durability and specificity of project assets. This is consistent with the conventional wisdom about what determines the maturity structure of long-term debt contracts.

Asquith, Gertner, and Scharfstein examine the events that followed the onset of financial distress for 102 public junk bond issuers. They find that out-of-court debt relief comes mainly from junk bond holders; banks almost never forgive principal, although they do defer payments and waive debt covenants. Asset sales are an important means of avoiding Chapter 11 reorganization, although they may be limited by industry factors. If a company simply restructures its bank debt, but either does not restructure its public debt or does not sell major assets or merge, it goes bankrupt. But the structure of a company’s liabilities affects the likelihood of going bankrupt. Companies whose bank and private debt are secured, as well as companies with complex public debt structures, are more prone to bankruptcy. Finally, more profitable distressed companies are no more successful in dealing with financial distress than other companies are; they are no less likely to go bankrupt, sell assets, or reduce capital expenditures.

Also participating were: Carliss Y. Baldwin, Martin Feldstein, Richard S. Ruback, and Andrei Shleifer, NBER and Harvard University; Geoffrey Carliner, NBER; Paul Healy, MIT; Edward J. Kane, NBER and Ohio State University; Robert L. McDonald, NBER and Northwestern University; Mitchell Petersen, University of Chicago; James M. Poterba, NBER and MIT; Erik Sirri, Peter Tufano, and Karen Wruck, Harvard University; and René Stulz, Ohio State University.

Economic Fluctuations Research Meeting

More than 85 members and guests of the NBER’s Program in Economic Fluctuations met at Stanford University on February 7. Ricardo J. Caballero, NBER and Columbia University, and John Heaton, NBER and MIT, organized the following program:

R. Anton Braun, University of Virginia, and Charles Evans, Federal Reserve Bank of Chicago, “Seasonal Solow Residuals and Christmas: A Case for Labor Hoarding and Increasing Returns”

Discussant: Julio J. Rotemberg, NBER and MIT

John Shea, University of Wisconsin, “Do Supply Curves Slope Up?”

Discussant: Mark Bils, NBER and University of Chicago

Christopher Phelan, University of Wisconsin, “Incentives, Inequality, and the Business Cycle”

Discussant: Andrew Atkeson, NBER and University of Chicago

Hugo Hopenhayn, Stanford University, and Richard Rogerson, NBER and University of Minnesota, “Job Turnover and Policy Evaluation: A General Equilibrium Analysis”

Discussant: Steve J. Davis, NBER and University of Chicago

Andrew Caplin, NBER and Columbia University, and John Leahy, Harvard University, “Business as Usual, Market Crashes, and Wisdom After the Fact”

Discussant: David Romer, NBER and University of California, Berkeley

Steven Strongin, Federal Reserve Bank of Chicago, “The Identification of Monetary Policy Disturbances: Explaining the Liquidity Puzzle”

Discussant: Christopher A. Sims, NBER and Yale University

Braun and Evans find that in the fourth quarter of the year, total factor productivity grows rapidly, at an annual rate of 24 percent; in the first quarter, it regresses sharply, at an annual rate of minus 30 percent. Two potential explanations for this seasonal variation are labor hoarding and increasing returns to scale. Braun and Evans find that, with increasing returns and labor effort that varies over time, the Christmas holiday alone explains the seasonal variation in consumption, average productivity, and output in all four quarters of the year.

Shea finds that demand shocks tend to induce positive covariance between price and quantity for manufacturing industries in the United States. That is, he finds that supply curves slope up. His results suggest that increasing returns to scale and countercyclical price-cost margins are not particularly important to the behavior of manufacturing prices in the United States.

Phelan describes an economy in which the distribution of consumption is generated through optimal incen-

tive schemes. The incentive problem (that is, unobserved levels of effort) is handled through lifetime contracts between agents and firms. Phelan's main result is that inequality in countercyclical consumption is the natural outcome of a world in which bad times yield better information regarding individual levels of effort than good times do.

Hopenhayn and Rogerson model the process of job reallocation across firms and evaluate the implications of policies that interfere with this process. They find that a tax on job destruction at the firm level has a sizable negative impact on total employment: a tax equal to one year's wages reduces employment by roughly 1.5 percent. In terms of consumption, the cost of this same tax is more than 2 percent. This welfare loss arises through a decrease in average productivity of over 2 percent.

Caplin and Leahy note that there are many actions that agents are reluctant to take, but that contain relevant information for other market participants. The reluctance to act traps information locally, possibly concealing pessimistic private assessments. In this situation, a break with past behavior by one agent may set off a chain reaction, as new information is released to the market and others respond. Caplin and Leahy demonstrate that such crashes result naturally when information is dispersed and action is costly. While many persons may have harbored reservations privately prior to a crash, the consensus is known only after the fact.

Strongin finds that failure to take proper account of the Federal Reserve's policy of accommodating short-run disturbances to reserve demand leads to a misidentification of demand shocks as supply shocks. He proposes a new method of identifying supply shocks that avoids this confusion. He then finds that a positive innovation in nonborrowed reserves, adjusted for the accommodation of shocks to reserve demand, has a strong and persistent negative effect on interest rates and a positive persistent effect on price. "Money" explains approximately 25 percent of the variance in output over a two-year horizon. Finally, Strongin finds that the liquidity effects are persistent, and directly related to the persistence of the response of nonborrowed reserves to an innovation in policy. This suggests that even anticipated accommodative policy actions have a substantial negative impact on interest rates.

Impulses and Propagation Mechanisms

Members and guests of the NBER's Program in Economic Fluctuations held a workshop on "Impulses and Propagation Mechanisms" in Palo Alto on February 8. Lawrence J. Christiano, Federal Reserve Bank of Minneapolis, and Martin S. Eichenbaum, NBER and Northwestern University, organized the following program:

Timothy Fuerst, Northwestern University, "The Availability Doctrine"

Discussant: Michael Woodford, NBER and University of Chicago

Christopher A. Sims, NBER and Yale University, "Identifying Monetary Policy Disturbances"

Discussant: Thomas J. Sargent, NBER and Hoover Institution, Stanford University

R. Anton Braun, University of Virginia, and Lawrence J. Christiano, "Is Long-Run M1 Demand Stable?"

Discussant: Julio J. Rotemberg, NBER and MIT

Vittorio U. Grilli, NBER and University of London, and Nouriel Roubini, NBER and Yale University, "Financial Intermediation and Monetary Policy in the World Economy"

Discussant: Patrick J. Kehoe, University of Minnesota

Lawrence J. Christiano and Martin S. Eichenbaum, "Liquidity Effects and the Monetary Transmission Mechanism"

Discussant: Ben S. Bernanke, NBER and Princeton University

Fuerst develops a general equilibrium model that combines credit rationing with limited participation fiat money. Most credit rationing models are real models in which fluctuations in the nominal quantity of fiat money have no effect on the availability of real credit. However, under the assumption of limited participation, changes in the nominal supply of fiat money *do* affect the real supply of credit, because a subset of the economy must absorb a disproportionate share of the money injection.

In real business cycle models, the demand for money is generated by transactions costs and a monetary policy that smooths interest rates. These models can reproduce the predictive power of the money stock and interest rates for nominal GNP, but have a harder time reproducing the actual relationships of these variables to real GNP. Sims fits such a model to the data and discusses the implications of his results for learning about the effectiveness of monetary policy.

Braun and Christiano analyze the stability of long-run demand for money. They estimate and evaluate the empirical evidence on instability, as well as the evidence of stability documented by Lucas.

Grilli and Roubini investigate the role of credit institutions in transmitting monetary shocks to the domestic economy and to the rest of the world. They distinguish between monetary injections via lump-sum transfers to individuals and those via increased credit to the commercial banking sector, in the form of discount window operations. They also distinguish between the discount rate of the central bank, and the lending and borrowing interest rates of commercial banks, which are assumed to be subject to reserve requirements. Grilli and Roubini find that a steady-state increase in monetary injections, via increases in domestic credit, leads to an increase in domestic output. Conversely, an increase in the steady-state level of monetary transfers reduces the level of output.

A recently developed class of general equilibrium models can rationalize the contemporaneous response of interest rates, output, and employment to a money supply shock. However, these models cannot rationalize *persistent* liquidity effects. Christiano and Eichenbaum discuss the basic frictions and mechanisms underlying this new class of models and investigate one avenue for generating persistence. They argue that once a simplified version of their 1991 model is modified to allow for extremely small costs of adjusting sectoral flow of funds, then positive money shocks generate long-lasting, quantitatively significant liquidity effects, as well as persistent increases in aggregate economic activity.

Others participating in the workshop were: Wouter den Haan, University of California, San Diego; Charles Evans and Steven Strongin, Federal Reserve Bank of Chicago; Mark L. Gertler, NBER and New York University; Robert E. Hall and Kenneth L. Judd, NBER and Hoover Institution, Stanford University; Valerie A. Ramey, NBER and University of California, San Diego; Donald Schlagenhauf and Jeffrey Wrase, Arizona State University; and Mark W. Watson, NBER and Northwestern University.

Discussant: Raquel Fernandez, NBER and Boston University

Ricardo J. Caballero, NBER and Columbia University, and Mohamad L. Hammour, Columbia University, "The Cleansing Effect of Recessions" (NBER Working Paper No. 3922)

Discussant: John C. Haltiwanger, University of Maryland

Mortensen and Pissarides develop a model of job destruction that coexists with job creation at all phases of the business cycle. The model explains the principal cyclical properties of the data on U.S. manufacturing.

Imrohorglu, Imohorglu, and Joines ask what the quantitative impact of Social Security is on lifetime welfare and the capital stock. They find that the optimal level of Social Security is very sensitive to the intertemporal elasticity of substitution in consumption. The effective subjective discount factor is the product of a subjective discount factor greater than one and the unconditional probability of survival; this product rises at early stages in the life cycle but declines toward retirement age.

Bertola and Felli study wage determination, relaxing the standard assumption that wages adjust continuously to reflect on-the-job performance. They assume that workers have no bargaining power. Turnover occurs when employers fire workers, not when workers quit. Workers have individual incentives to lobby for increased job security, but if such lobbying efforts are successful, inefficiently low turnover may result.

Jovanovic estimates the amount of production lost because agents cannot capitalize fully on the beneficial production spillovers that exist among them. In a perfectly coordinated economy in which agents' locations reflect the nature of the spillovers, GNP will be at least one and a half to two and a half times larger than GNP of an economy in which agents locate at random. Jovanovic concludes that coordination makes a big difference to per capita GNP, and that cross-country differences in coordination of activities may explain a large portion of cross-country inequality.

Kennan and Wilson develop a model of repeated labor negotiations. In equilibrium, the union goes through cycles of optimism and pessimism, triggered by the outcomes of strikes. Such information cycles in repeated bargaining also are of potential interest in other applications, such as the analysis of contracts governing the supply of intermediate goods, like steel or computers, to producers of final goods, such as autos.

Caballero and Hammour investigate how industries respond to cyclical variations in demand. Because of innovation, production units that embody the newest techniques are being created continuously, and outdated units are being destroyed. Outdated production units are the most likely to become unprofitable and to be scrapped in a recession, but they can be "insulated" from the fall in demand if it is accompanied by a reduction in the creation rate.

Micro and Macro Perspectives on the Aggregate Labor Market

Members and guests of the NBER's Program in Economic Fluctuation held a workshop on "Micro and Macro Perspectives on the Aggregate Labor Market" on February 9. Richard Rogerson, NBER and University of Minnesota, and Randall Wright, University of Pennsylvania, organized the following agenda:

Dale T. Mortensen, Northwestern University, and Christopher Pissarides, London School of Economics, "The Cyclical Behavior of Job Creation and Job Destruction"

Discussant: Edward L. Glaser, University of Chicago

Ayse Imrohorglu, Selhattin Imrohorglu, and Douglas Joines, University of Southern California, "A Dynamic Stochastic General Equilibrium Analysis of Social Security"

Discussant: Thomas J. Sargent, NBER and Stanford University

Giuseppe Bertola, NBER and Princeton University, and Leonardo Felli, Boston College, "Wages and Job Security in a Matching Model"

Discussant: Hugo Hopenhayn, Stanford University

Boyan Jovanovic, NBER and New York University, "Coordination and Spillovers"

Discussant: Russell Cooper, NBER and Boston University

John Kennan, University of Iowa, and Robert Wilson, Stanford University, "Repeated Wage Bargaining with Private Information"

Also participating in the workshop were: Steve J. Davis, NBER and University of Chicago; William T. Dickens, NBER and University of California, Berkeley; Steven Neil Durlauf, NBER and Stanford University; and Douglas O. Staiger, Stanford University.

Monetary Economists Gather in Cambridge

Members of the NBER's Program in Monetary Economics and their guests gathered in Cambridge on February 28. Program Directors Benjamin M. Friedman and N. Gregory Mankiw, NBER and Harvard University, organized the day-long program:

Laurence M. Ball, NBER and Princeton University, and N. Gregory Mankiw, "Asymmetric Price Adjustment and Economic Fluctuations"

Discussant: Julio J. Rotemberg, NBER and MIT

Steven Strongin, Federal Reserve Bank of Chicago, "The Identification of Monetary Policy Disturbances: Explaining the Liquidity Puzzle" (See "Economic Fluctuations Research Meeting" earlier in this "Bureau News" section.)

Discussant: Martin S. Eichenbaum, NBER and Northwestern University

Alberto Alesina, NBER and Harvard University, and Vittorio U. Grilli, NBER and Birkbeck College, "The European Central Bank: Reshaping Monetary Politics in Europe"

Discussant: Jeffrey A. Frankel, NBER and University of California, Berkeley

Christina D. Romer, NBER and University of California, Berkeley, "What Ended the Great Depression?" (NBER Working Paper No. 3829)

Discussant: Stephen G. Cecchetti, NBER and Ohio State University

Rudiger Dornbusch and Stanley Fischer, NBER and MIT, "Moderate Inflation" (NBER Working Paper No. 3896)

Discussant: Michael D. Bordo, NBER and Rutgers University

Alessandra Casella and Barry J. Eichengreen, NBER and University of California, Berkeley, "Halting Inflation in Italy and France After World War II" (NBER Working Paper No. 3852)

Discussant: Robert B. Barsky, NBER and University of Michigan

Ball and Mankiw propose an explanation for the asymmetric adjustment of nominal prices. In their model, firms' relative prices decline automatically between price adjustments. In this environment, shocks that raise firms' desired relative prices trigger larger price responses than shocks that lower desired prices. This asymmetry has implications for three issues in macroeconomics: the real effects of aggregate demand; the effects of sectoral shocks; and the optimal rate of inflation.

How will the creation of a European Central Bank (ECB) change the political economy of monetary policy in Europe? Alesina and Grilli discuss the likely consequences of a recently proposed statute delineating the ECB's institutional structure on the conduct of monetary policy at the European level. They are particularly concerned with the trade-off between inflation and stabilization. They also analyze the role of political independence of the ECB, and the effect of the voting rules for the ECB board members on policy choices.

Romer finds that nearly all of the observed recovery of the U.S. economy between the Great Depression and 1942 was caused by monetary expansion. Huge gold inflows in the mid- and late 1930s swelled the U.S. money stock and stimulated the economy by lowering real interest rates and encouraging investment spending and purchases of durable goods. Romer's results imply that self-correction played little role in the growth of real output between 1933 and 1942.

Dornbusch and Fischer find that most episodes of moderate inflation were triggered by commodity price shocks. These episodes were brief, and rarely ended in higher inflation. They also find that seigniorage plays at most a modest role in the persistence of moderate inflations. Such inflations can be reduced only at a substantial short-term cost to growth.

Casella and Eichengreen compare the post-World War II experiences of Italy and France to shed light on the nature of the inflationary process and the cause of its decline. They conclude that inflation was symptomatic of an unresolved distributional conflict. It ended when one political group, the Left in these two countries, accepted its defeat. The Marshall Plan helped to bring about the stabilization by reducing the costs to the group offering concessions. The French delay of one year in achieving stabilization can be explained by differences in the political climate and the ambitious program of public investment.

Also participating in this meeting were: Andrew B. Abel and Stephen P. Zeldes, NBER and University of Pennsylvania; Susanto Basu, Antonio Fatas, and John Leahy, Harvard University; Michael Bruno, NBER and Hebrew University; Herschel I. Grossman, NBER and Brown University; R. Glenn Hubbard, NBER and U.S. Department of the Treasury; David Johnson, Wilfrid Laurier University; Bennett T. McCallum, NBER and Carnegie-Mellon University; Jeffrey A. Miron, NBER and Boston University; Frederic S. Mishkin, NBER and Columbia University; Anna J. Schwartz, NBER; and Mark W. Watson, NBER and Northwestern University.

Productivity Program Meets

Members of the NBER's Program in Productivity gathered in Cambridge on March 13 to discuss the following papers, chosen by Program Director Zvi Griliches and Adam B. Jaffe, NBER and Harvard University:

Rebecca Henderson, NBER and MIT; Adam B. Jaffe; and Manuel Trajtenberg, NBER and Tel-Aviv University; "Basicness and Appropriability of R and D: A Comparison of University and Corporate Research with the Aid of Patent Data"

James Adams, U.S. Bureau of the Census, "Efficient Funding of Scientific Research: An Experiment in Applied Welfare Economics"

Boyan Jovanovic, NBER and New York University, "Coordination and Spillovers" (See "Micro and Macro Perspectives on the Aggregate Labor Market" earlier in this "Bureau News" section.)

Iain Cockburn, NBER and University of British Columbia, and Rebecca Henderson, "Scale, Scope, and Spillovers: Research Strategy and Research Productivity in the Pharmaceutical Industry"

Henderson, Jaffe, and Trajtenberg examine the pattern of patent citations made and received within the same technological fields by universities and corporations. They then develop measures of the "basicness" of inventions, looking both "backward" (to citations made) and "forward" (to citations received). Their measures are consistent with prior beliefs about the relative basicness of university and corporate research, the relationship between basicness and appropriability, and the existence of technological "trajectories."

Adams estimates the efficiency of funding academic science in terms of economic growth. He finds that the returns to science average 70 to 80 percent per year. His results support the implication that longer lags in the effect of science entail higher social rates of return. However, he does not find a one-to-one relationship between returns to science and capital.

Using data from six major pharmaceutical firms, Cockburn and Henderson find positive returns to scale and scope at the firm level, but decreasing returns to scale at the level of the individual research program, despite the fact that the marginal productivity of research increases with the size of the program. Research productivity differs significantly across therapeutic classes and between firms. Also, spillovers both within and between firms are correlated positively with research productivity.

Also attending this meeting were Michael Fogarty, Case Western Reserve University, and the following NBER associates: Jeffrey I. Bernstein, Carleton University; Geoffrey Carliner; Sanghamitra Das, Indiana University; Melvyn A. Fuss, University of Toronto; Shane Greenstein, University of Illinois; Bronwyn H. Hall, University of California, Berkeley; Elizabeth Kremp, Centre d'Etudes Prospective et d'Information Internationales;

Frank R. Lichtenberg, Columbia University; Robert E. Lipsey, City University of New York; Catherine J. Morrison, Tufts University; Daniel Raff, Harvard University; and Edward N. Wolff, New York University.

DAE Program Meeting

Claudia Goldin, director of the NBER's Program in Development of the American Economy, organized a program meeting in Cambridge on March 14. About 30 researchers gathered to discuss the following papers:

Jeffrey G. Williamson, NBER and Harvard University, "The Evolution of Global Labor Markets in the First and Second World Since 1830: Background Evidence and Hypotheses"

Joseph P. Ferris, Northwestern University, "Geographic Mobility of European Immigrant Arrivals at New York, 1840 to 1860"

Charles P. Jones and Jack W. Wilson, North Carolina State University, and Richard E. Sylla, NBER and New York University, "Financial Markets and the Great Merger Wave of 1895-1904"

Jeremy Atack, NBER and University of Illinois at Urbana-Champaign, and Fred Bateman, University of Georgia, "Did the United States Industrialize Too Slowly?"

Williamson develops a new annual database of real wage rates, adjusted for purchasing power parity, for unskilled labor from 1830-1988. He uses this data to study the economic convergence of currently industrialized nations. Williamson points out that much of the convergence prior to World War II narrowed the gap between the Old World and the New, rather than narrowing gaps within regions. He also shows how natural resource endowment and factor price equalization may explain a significant share of the convergence.

Ferris describes his new sample of European immigrants, assembled from passenger ship records of 1840-60 and manuscript schedules of the 1850 and 1860 federal Censuses of population. He learns that immigrants who arrived at New York between 1840 and 1850 left quickly: fewer than 25 percent of them spent a significant amount of time there. Most immigrants settled in the Northeast, although the wealthiest and some of the poorest headed west. Any further movement that took place between 1850 and 1860 was mainly from east to west, and from urban to rural places. The immigrants with the best occupations and most wealth were those who stayed in the same county between 1850 and 1860, or those who moved to different regions of the country.

Investigators commonly find that a high level or rising trend of stock prices is associated with merger waves.

This leads to the hypothesis that a buoyant stock market causes mergers. But Jones, Wilson, and Sylla demonstrate that "low" stock prices contributed to the Great Merger Wave that restructured American industry at the turn of the century.

Atack and Bateman present new estimates of profitability in American manufacturing (for 1850, 1860, 1870, and 1880) and agriculture (for 1860 and 1880). These rates of return indicate a substantial misallocation of capital resources and imperfect capital market behavior before 1870, but more efficient capital mobilization into manufacturing by 1880. The authors hypothesize that the sources of these imperfections included local monopoly and monopsony, capital market institutions unadapted to industrial demands, and uncertainty surrounding industrial investment.

Meeting of Public Economics Group

Over 40 members and guests of the NBER's Program in Public Economics gathered in Cambridge on April 2–3 to discuss the following papers, selected by Program Director James M. Poterba, of NBER and MIT:

Kevin A. Hassett, Columbia Business School, and Gilbert E. Metcalf, NBER and Princeton University, "Energy Tax Credits and Residential Conservation Investment" (NBER Working Paper No. 4020)

Discussant: Jeffrey K. MacKie-Mason, NBER and University of Michigan

David M. Cutler, NBER and Harvard University, and Lawrence F. Katz, NBER and Harvard University, "Rising Inequality? Changes in the Distribution of Income and Consumption in the 1980s" (NBER Working Paper No. 3964)

Discussant: Alan B. Krueger, NBER and Princeton University

Lawrence H. Goulder, NBER and Stanford University, "Do the Costs of a Carbon Tax Vanish When Interactions with Other Taxes Are Accounted For?" (NBER Working Paper No. 4061)

Discussant: James M. Poterba

Patricia M. Anderson, Dartmouth College, and Bruce D. Meyer, NBER and Northwestern University, "The Incentives and Cross-Subsidies of the UI Payroll Tax"

Discussant: Robert A. Moffitt, NBER and Brown University

Douglas Holtz-Eakin, NBER and Syracuse University; David Joulfaian, U.S. Department of the Treasury; and Harvey S. Rosen, NBER and Princeton University, "The Carnegie Conjecture: Some Empirical Evidence"

Discussant: Charles T. Clotfelter, NBER and Duke University

Kose John, New York University; Lemma Senbet, University of Maryland; and Anant Sundaram, Dartmouth College, "Corporate Limited Liability and the Design of Corporate Taxation"

Discussant: Roger H. Gordon, NBER and University of Michigan

Hassett and Metcalf show that an investment subsidy will not increase investment in residential energy conservation significantly. Also, using data on roughly 38,000 individual tax returns over 1979–81, they estimate that raising the federal energy credit by 10 percent would increase the percentage of households claiming it only from 5.7 percent to 7.1 percent.

Cutler and Katz report similar changes in the distribution of income and consumption in the United States during the 1980s. The lowest quintile consumed 0.9 percentage points less and earned 0.6 percentage points less in 1988 than in 1980. Using the official federal poverty thresholds, Cutler and Katz also find that the overall "consumption poverty rate" was 3 percent below the "income poverty rate" in 1988. Further, the consumption poverty rate for the elderly was only 60 percent of the rate for other adults, and about 30 percent of the rate for children, in 1988.

Goulder finds that, in terms of GNP and welfare, the costs of the carbon tax are significantly lower than what would be predicted if interactions with other taxes were disregarded. When the revenues from a carbon tax are used to finance reductions in marginal taxes at the personal or corporate level, instead of lump-sum reductions in taxes, then the welfare costs are 25–32 percent lower. The relatively light taxation of industries that produce fossil fuels compared to other industries implies that the gross efficiency costs of carbon taxes are about 15 percent lower than would be the case without this special treatment.

Using firm and employee records from state unemployment insurance (UI) systems, Anderson and Meyer find that most unemployment is attributable to firms with positive but low UI tax costs; a much smaller percentage of unemployment is attributable to firms at the maximum UI tax rate. Indeed, many layoffs that result in UI payments are made by firms not charged for UI claims because they have employed the individual for less than two calendar quarters. Construction, manufacturing, agriculture, and mining consistently receive subsidies from the UI system, while all other industries tend to pay more in taxes than they receive in benefits.

Holtz-Eakin, Joulfaian, and Rosen examine tax return data on the labor force behavior of people who receive inheritances. Their results are consistent with Andrew Carnegie's century-old assertion that large inheritances decrease a person's labor force participation. They find that a single person who receives an inheritance of about \$150,000 is roughly four times more likely to leave the labor force than a person with an inheritance below \$25,000. Additional, albeit weaker, evidence suggests that inheritances depress labor supply, even when participation is unaltered.

John, Senbet, and Sundaram examine the role of a well-designed corporate tax structure in aligning private investment choices with socially optimal levels. An appropriately high constant tax rate imposed on positive cash flows provides sufficient investment disincentives to offset the overinvestment incentives of limited liability. However, the optimal tax rate depends on the technology of individual firms. The authors show that a tax structure designed with an economywide single tax rate, when combined with other features such as an initial zero tax bracket, investment-based deductions, tax credits, and tax deductibility of debt, can replicate the incentives of an economy with multiple technology-specific tax rates. Institutional features observed in many advanced economies are consistent with such a design of taxation.

Reprints Available

The following NBER Reprints, intended for nonprofit education and research purposes, are now available. (Previous issues of the *NBER Reporter* list titles 1-1681 and contain abstracts of the Working Papers cited below.)

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1691. "International Trade with Endogenous Technological Change," by Luis A. Rivera-Batiz and Paul M. Romer, 1991 (NBER Working Paper No. 3594)
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1695. "Stochastic Trends and Economic Fluctuations," by Robert G. King, Charles I. Plosser, James H. Stock, and Mark W. Watson, 1991 (NBER Working Paper No. 2229)
1696. "The Globalization of Information and Capital Mobility," by William H. Branson and Dwight M. Jaffee, 1991 (NBER Working Paper No. 3496)
1697. "The Effect of Information Releases on the Pricing and Timing of Equity Issues," by Robert A. Korajczyk, Deborah J. Lucas, and Robert L. McDonald, 1991 (NBER Working Paper No. 2727)
1698. "Monetary Economics: A Review Essay," by Herschel I. Grossman, 1991 (NBER Working Paper No. 3686)
1699. "How Strong Are Bequest Motives? Evidence Based on Estimates of the Demand for Life Insurance and Annuities," by B. Douglas Bernheim, 1991 (NBER Working Paper No. 2942)
1700. "A Simple Test of Consumption Insurance," by John H. Cochrane, 1991 (NBER Working Paper No. 2642)

Bureau Books

Eichengreen Monograph

Golden Fetters: The Gold Standard and the Great Depression, 1919–1939, by Barry J. Eichengreen, is now available from Oxford University Press for \$39.95. This book reassesses the international monetary crises of the post–World War I period that led to the Great Depression of the 1930s. It also analyzes the responses of the world economic powers to the Depression and how new monetary policies set the stage for the watershed post–World War II system established at Bretton Woods. Eichengreen also offers new theories of the effect of the Great Depression on the collapse of the world monetary system.

This volume is nontechnical and should interest both economists and historians. Eichengreen is a professor of economics at the University of California, Berkeley, and a research associate in the NBER's Program in International Studies.

Order from Oxford University Press, Order Department, 2001 Evans Road, Cary, NC 27513; phone (919) 677-0977.

The following volumes may be ordered directly from the University of Chicago Press, Order Department, 11030 South Langley Avenue, Chicago, IL 60628. 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.

Three New Volumes from UCPress

Three NBER volumes are available from the University of Chicago Press this spring.

Strategic Factors in Nineteenth Century History: A Volume to Honor Robert W. Fogel, edited by Claudia Goldin and Hugh Rockoff, presents new research on the implications of expanding markets in labor and capital during the 19th century. Using methods pioneered by Fogel, the authors explore the evolution of markets in agriculture, manufacturing, and finance—that is, credit and capital. Then they consider the demography of free and slave populations, and finally the institutions of government and unions. This book should interest both historians and economists.

1701. "Volatility Tests and Efficient Markets: A Review Essay," by John H. Cochrane, 1991 (NBER Working Paper No. 3591)
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1706. "House Price Dynamics: The Role of Tax Policy and Demography," by James M. Poterba, 1991
1707. "Habit Persistence and Durability in Aggregate Consumption: Empirical Tests," by George M. Constantinides and Wayne E. Ferson, 1991 (NBER Working Paper No. 3631)
1708. "Determinants of External Imbalances: The Role of Taxes, Government Spending, and Productivity," by Leonardo Leiderman and Assaf Razin, 1991 (NBER Working Paper No. 3738)
1709. "Spectral-Based Testing of the Martingale Hypothesis," by Steven N. Durlauf, 1991 (NBER Technical Working Paper No. 90)
1710. "Macroeconomic Convergence: International Transmission of Growth and Technical Progress," by Alan Chung and John F. Helliwell, 1991 (NBER Working Paper No. 3264)
1711. "The International Comparison Program: Current Status and Problems," by Irving B. Kravis and Robert E. Lipsey, 1991 (NBER Working Paper No. 3304)

Goldin is a professor of economics at Harvard University and the director of the NBER's Program in the Development of the American Economy. Rockoff is a professor of economics at Rutgers University and a research associate in the same program. This volume sells for \$60.00.

Topics in the Economics of Aging, edited by David A. Wise, is the third volume to come out of the NBER's project on aging. It includes studies on the decision to retire, saving for retirement, living arrangements and family support of the elderly, and Social Security reform. As such, this volume should be of broad general interest. It is priced at \$55.00.

Wise is the John F. Stambaugh Professor of Political Economy at the Kennedy School of Government, Harvard University, and director of the Bureau's research on aging.

Business Cycles: Theory, History, Indicators, and Forecasting, by Victor Zarnowitz, explores the theories of business cycles, the measures of economic activity, the performance of leading indicators, and the range of forecasting tools and their performance. This volume is priced at \$65.00.

Zarnowitz is professor emeritus at the University of Chicago Graduate School of Business.

Current Working Papers

Individual copies of NBER Working Papers, Technical Working Papers, and Historical Factors in Long-Run Growth Working 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.

Multiple authors are listed alphabetically. *Journal of Economic Literature* (JEL) subject codes, when available, are listed after the date of the Working 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 Working Papers are in the Development of the American Economy program.

Abstracts of all Working Papers issued since December 1991 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.

Technical Working Paper

Computing Markov Perfect Nash Equilibria: Numerical Implications of a Dynamic Differentiated Product Model

Ariel Pakes and Paul McGuire

Technical Working Paper No. 119

January 1992

JEL Nos. D40, L10, L40, L50, C63

Productivity

This paper provides an algorithm for computing Markov Perfect Nash Equilibria (Maskin and Tirole, 1988a and b) for dynamic models that allow for heterogeneity among firms and idiosyncratic (or firm-specific) sources of uncertainty. Our purposes are to illustrate the ability of such models to reproduce important aspects of reality, and to provide a tool for both descriptive and policy analysis in a framework rich enough to capture many of the features of firm-level datasets (thereby enabling it to be integrated with the empirical detail in those datasets).

We illustrate by computing the policy functions, and simulating the industry structures, generated by a class of dynamic differentiated product models in which the idiosyncratic uncertainty is caused by the random outcomes of each firm's research process. (We also allow for an autonomous aggregate demand process.) The illustration focuses on the effects of different regulatory and institutional arrangements on market structure, and on welfare, for one particular set of parameter values. The simulation results are of independent interest and can be read without delving into the technical detail of the computational algorithm.

The last part of the paper begins with an explicit consideration of the computational burden of the algorithm, and then introduces approximation techniques designed to make computation easier. This section provides some analytic results that dramatically reduce the computational burden of computing equilibria for industries in which a large number of firms are typically active.

Historical Factors in Long-Run Growth

Toward a New Synthesis on the Role of Economic Issues in the Political Realignment of the 1850s

Robert W. Fogel

Historical Working Paper No. 34

January 1992

After sketching various ways in which economic issues influenced the political realignment of the 1850s, this paper concentrates on: 1) the timing of those issues, and the disjunctions in economic developments across regions and classes; 2) the size of the nonagricultural male labor force in the North toward the end of the 1850s, and the ethnic and residential distributions of these workers; 3) changes in the ethnic composition of

Anatomy of Financial Distress: An Examination of Junk Bond Issuers

Paul Asquith, Robert Gertner,
and David S. Scharfstein
NBER Working Paper No. 3942
December 1991
JEL Nos. G33, G32
Corporate Finance

This paper examines the events that followed the onset of financial distress for 102 public junk bond issuers. We find that out-of-court debt relief comes mainly from junk bond holders. Banks almost never forgive principal, although they do defer payments and waive debt covenants. Sales of assets are an important means of avoiding Chapter 11 reorganization, but they may be limited by industry factors. If a company simply restructures its bank debt, but either does not restructure its public debt or does not sell major assets or merge, the company goes bankrupt. The structure of a company's liabilities affects the likelihood that it will go bankrupt: companies whose bank and private debt are secured, as well as companies with complex public debt structures, are more prone to go bankrupt. Finally, we find that more profitable distressed companies are no less likely to go bankrupt, sell assets, or reduce capital expenditures than other companies.

The Adjustment Mechanism

Maurice Obstfeld
NBER Working Paper No. 3943
December 1991
JEL No. F3
International Studies

I study the mechanisms of international payments adjustment that existed under the Bretton Woods system of fixed exchange rates from 1945 to 1971. I argue that two market failures, imperfect mobility of international capital and imperfect flexibility of wages and prices, are central to understanding the adjustment problems of that period.

Imperfect capital mobility implied that even intertemporally solvent governments could face international liquidity constraints. Wage-price inflexibility implied that countries suffering from simultaneous reserve loss and unemployment might need to undergo lengthy transitions before returning to balance.

By the 1960s, when trade had been liberalized substantially and partial convertibility was restored, the main remaining adjustment weapon was currency realignment: devaluation could eliminate an unemployment-cum-deficit dilemma in a single stroke, while revaluation could relieve the inflationary pressures in surplus countries. The currency realignment option proved incompatible with the growing efficiency of the international capital market, however.

Under the classical gold standard, high capital mobility had supported the credibility of fixed exchange rates.

the northern electorate, and the sharp shift in the partisan affiliations of "Old Americans," especially between 1852 and 1860; 4) problems in measuring the ups and downs in the standard of living of northern nonagricultural workers between 1840 and 1860, and provisional estimates of the decline in their real wages between 1848 and 1855; and 5) a provisional estimate of the excess supply of labor during 1854–5 created by the unfortunate phasing of three cycles (the collapse of a long cycle in construction, the coincident trough of a relatively mild trade cycle, and the continued upswing of a long cycle in immigration).

Gresham's Law Regained

Robert L. Greenfield and Hugh Rockoff
Historical Working Paper No. 35
January 1992
JEL No. N21

It has been argued that Gresham's Law—bad money (that is, money with a low value in nonmonetary uses) drives out good—often fails because one money can continue to circulate at its market value. Various cases involving the U.S. dollar during the nineteenth century have been cited as possible violations of the law resulting from nonpar circulation of the dollar. This paper analyzes these cases, and finds, to the contrary, that a "93 percent version" of Gresham's Law held in all of them. Evidently there were high transactions costs associated with using good money at a premium, or bad money at a discount.

The Evolution of Global Labor Markets in the First and Second World Since 1830: Background Evidence and Hypotheses

Jeffrey G. Williamson
Historical Working Paper No. 36
February 1992
JEL No. N30

There are a number of shortcomings in the debate over the economic convergence of currently industrialized nations. First, the underlying database typically has been limited to Agnus Maddison's GNP and GNP per worker-hour. This paper offers a new database: real wage rates for unskilled labor adjusted for purchasing power parity. Second, the debate has focused on end points from the 19th century to the present, paying little attention to differential behavior in four distinct regimes: 1830 to the late 1850s, the 1850s to World War I, the interwar decades, and the post-World War II experience. Third, with some recent exceptions, the search for explanations has focused primarily on technological advance, ignoring the potential role of global factor and commodity market integration (and disintegration). The new real wage database confirms some old stylized facts and offers some new ones. It also points out how these four regimes differed. They differed enough to suggest that different explanations will be necessary to account for the convergence over the past century and a half.

Under Bretton Woods, fixed gold parities did not have primacy among other economic objectives. Increasing capital mobility undermined the regime, as governments proved unwilling to stand by key systemic commitments.

The Debt Burden and Debt Maturity

Olivier Jean Blanchard and **Alessandro Missale**

NBER Working Paper No. 3944

December 1991

JEL Nos. E4, E6

Economic Fluctuations

At low and moderate levels of government debt, there is little relationship between the level of debt and its maturity. But at high levels of debt, a strong inverse relationship emerges. We begin by documenting this inverse relationship for those OECD countries that have reached very high levels of debt. We then provide a theory of the joint movements of debt and maturity that can explain both sets of facts. It is based on the idea that, at already high levels of debt, in order to maintain the credibility of its anti-inflation stance, the government may need to decrease the maturity of the debt as the amount of debt increases.

Tax Policy and Urban Development: Evidence from an Enterprise Zone Program

Leslie E. Papke

NBER Working Paper No. 3945

December 1991

JEL Nos. H71, H73

Taxation

In the 1980s, most states targeted certain depressed areas for revitalization by providing a combination of labor and capital tax incentives to firms operating in an "enterprise zone" (EZ). Despite the large number of state initiatives, and the frequent reintroduction of federal EZ legislation, there have been few statistical analyses of the effect of EZs, apart from the surveys of plan administrators. This paper analyzes the effect of the Indiana EZ program on local employment and investment, using a panel of local taxing jurisdictions.

In 1988, the direct budgetary costs of the Indiana program totaled over \$11 million, averaging \$13,933 per participating firm, \$4564 per new job, and \$31,113 per new zone resident job. I estimate that zone designation initially reduces the value of depreciable personal property by about 13 percent, but also reduces unemployment claims in the zone and surrounding community by 19 percent. (Both estimates are statistically significant.) The value of inventories in Indiana zones is 8 percent higher than it would be otherwise, and this estimated effect is marginally statistically significant.

How Pervasive Is the Product Cycle? The Empirical Dynamics of American and Japanese Trade Flows

Joseph E. Gagnon and **Andrew K. Rose**

NBER Working Paper No. 3946

January 1992

JEL Nos. F11, F12, F14

International Studies

Using comprehensive multilateral American and Japanese data, disaggregated to the four-digit SITC level, this paper looks for dynamic patterns in international trade flows. We find little evidence of product-cycle dynamics between 1962 and 1988. Rather, goods that begin the sample in surplus (deficit) almost always remain in surplus (deficit) throughout the sample.

The Rush to Free Trade in the Developing World: Why So Late? Why Now? Will It Last?

Dani Rodrik

NBER Working Paper No. 3947

January 1992

JEL Nos. I13, O10

International Studies

This paper asks why policymakers in developing countries have been so reluctant to undertake trade reform until the 1980s, and why many of them have embraced open trade policies so wholeheartedly since then. To answer these questions, I develop an index of the "political cost-benefit ratio" (PCBR) of policy reform. The PCBR is a measure of the amount of redistribution of income generated for every dollar of efficiency gain achieved by reform.

Judged by this index, trade reform performs very poorly: typically, liberalization leads to five dollars of income being reshuffled within the economy for every dollar of net efficiency gain. However, when the liberalization is undertaken at a point of deep macroeconomic crisis, in conjunction with stabilization policies, then the value of the PCBR index falls dramatically. This explains why trade reform is politically so difficult in normal times, and why times of crisis provide an opportune moment for undertaking structural reforms. I conclude by evaluating the sustainability of the reforms of the 1980s.

Convergence and Growth Linkages Between North and South

Alan Chung and **John F. Helliwell**

NBER Working Paper No. 3948

January 1992

JEL Nos. F43, O40, O47

Growth

Using cross-sectional data on 98 countries for 1960-85, we show that growth of per capita GDP depends negatively on initial income levels, as implied by the convergence hypothesis, as well as on international differences

in investment rates in physical and human capital. There is some evidence of slight economies of scale (1.06) among the industrial countries. The evidence in favor of the convergence hypothesis is strongest for the OECD countries and Latin America, and weakest for Asia. Growth in Latin America and Africa is lower than elsewhere, even after allowing for international differences in initial income levels, scale, schooling, and capital investment. For the OECD countries (for which capital stock data are available, there is convergence in rates of technical progress, suggesting that convergence of per capita GDPs is not just a function of differences in investment rates. The linkage between per capita GDP and the real exchange rate is strong for the OECD and Asia, weak for Africa, and negative for Latin America.

Shocking Aspects of Monetary Unification

Tamim Bayoumi and Barry J. Eichengreen

NBER Working Paper No. 3949

January 1992

JEL No. F3

International Studies

We analyze data on output and prices for 11 European Community (EC) member nations to extract information on underlying aggregate supply and demand disturbances. We then compare the coherence of the underlying shocks across countries, and the speed of adjustment to these shocks, to the results from U.S. regional data. We find that the underlying shocks are significantly more idiosyncratic across EC countries than across U.S. regions; this may indicate that the EC will find it more difficult to operate a monetary union than the United States does. However, a core of EC countries, made up of Germany and her immediate neighbors, experience shocks of similar magnitude and cohesion as the U.S. regions. EC countries also exhibit a slower response to aggregate shocks than U.S. regions do, presumably reflecting lower factor mobility.

Is There a Conflict Between EC Enlargement and European Monetary Unification?

Tamim Bayoumi and Barry J. Eichengreen

NBER Working Paper No. 3950

January 1992

JEL No. F3

International Studies

Recent proposals for enlarging the European Community (EC) to include the European Free Trade Association (EFTA) countries raise the question of whether the new members should participate in a European Monetary Union (EMU). In part, the issue hinges on the incidence of aggregate supply and demand disturbances. We use data on prices and output to analyze this issue

empirically, grouping economies according to the magnitude of the disturbances, their cross-country correlation, and speeds of response. This leads us to distinguish an EC "core" (made up of Germany and its immediate neighbors) and an EC periphery (made up of the United Kingdom and the Southern European members of the EC). Austria, Sweden, and Switzerland behave more similarly to the EC core than do Norway, Finland, and Iceland. This suggests that the case for EMU participation is stronger for Austria, Sweden, and Switzerland than for the other EFTA countries.

The Role of International Organizations in the Bretton Woods System

Kathryn M. Dominguez

NBER Working Paper No. 3951

January 1992

JEL Nos. F33, O19

International Studies

Even if countries understand that cooperation will lead them to a superior outcome, they need not cooperate unless they are convinced that other countries also are committed to doing so. In this context, international organizations can facilitate cooperation by serving as commitment mechanisms. In the Bretton Woods system, cooperation involved the maintenance of stable exchange rates and unrestricted trade among member countries. The commitment mechanisms that the Bretton Woods institutions provided to member countries included: rules of cooperation; the financial resources needed to play by the rules; and a centralized source of information on each others' commitment to the rules. Postwar history suggests that monitoring and sharing information has been a relatively effective commitment mechanism for international organizations.

Is Arbitration Addictive? Evidence from the Laboratory and the Field

Janet Currie and Henry S. Farber

NBER Working Paper No. 3952

January 1992

JEL No. J52

Labor Studies

Using data both from a laboratory bargaining experiment and from the field, we test for the presence of an addictive effect of arbitration (positive state dependence). We find no evidence of state dependence in the experimental data, and only weak evidence in the field data on teachers in British Columbia. Hence, we reject the view that use of arbitration per se leads to state dependence, either through reducing uncertainty about the arbitral process, or through changing the bargaining parties' perceptions about their opponents. Our results further suggest that an explanation for any positive state dependence in the B.C. field data must lie in an aspect of the arbitration process not captured by our simple experimental design.

Exchange Rate Flexibility, Volatility, and the Patterns of Domestic and Foreign Direct Investment

Joshua Aizenman

NBER Working Paper No. 3953

January 1992

JEL Nos. F31, F21, F41

International Studies

This paper investigates the factors that determine the impact of exchange rate regimes on the behavior of domestic investment and foreign direct investment (FDI), and the correlation between exchange rate volatility and investment. We assume that producers may diversify internationally in order to increase the flexibility of production: being a multinational enables a producer to reallocate employment and production toward the more efficient or the cheaper plant. We characterize the possible equilibriums in a macro model that allows for the presence of a short-run Phillips curve, under a fixed and a flexible exchange rate regime. We show that a fixed exchange rate regime is relatively more conducive to FDI than a flexible exchange rate is. This conclusion applies for both real and nominal shocks. The correlation between investment and exchange rate volatility under a flexible exchange rate depends on the nature of the shocks. If the dominant shocks are nominal, then we will observe a negative correlation; if the dominant shocks are real, we will observe a positive correlation between exchange rate volatility and the level of investment.

Labor Supply Flexibility and Portfolio Choice in a Life-Cycle Model

Zvi Bodie, Robert C. Merton,
and **William F. Samuelson**

NBER Working Paper No. 3954

January 1992

Asset Pricing

This paper examines the effect of the labor-leisure choice on portfolio and consumption decisions over an individual's life cycle. The model incorporates the fact that individuals may have considerable flexibility in varying their work effort (including their choice of when to retire). Given this flexibility, the individual simultaneously determines optimal levels of current consumption, labor effort, and a financial investment strategy at each point in the life cycle.

We show that labor and investment choices are intimately related. The ability to vary labor supply induces individuals to assume greater risks in their investment portfolios. We explain why the young (enjoying greater labor flexibility over their working lives) may take greater investment risks than the old. We also explain why consumption spending is relatively "smooth" despite volatility in asset prices. Finally, we provide a method for valuing the risky cash flows associated with future wage income.

Estimating Expected Exchange Rates Under Target Zones

Zhaohui Chen and Alberto Giovannini

NBER Working Paper No. 3955

January 1992

JEL Nos. F31, F33, C13

International Studies

We develop a simple procedure for estimating expected exchange rates under target zones. Our empirical results show that the fluctuation band effect is not trivial for narrow target zones, such as the Bretton Woods system. We also estimate the shapes of the distributions of exchange rates under target zones. Our empirical results show that distributions can take several different shapes, possibly corresponding to widely different monetary and exchange rate intervention policies.

Exploring the Relationship Between R and D and Productivity in French Manufacturing Firms

Bronwyn H. Hall and Jacques Mairesse

NBER Working Paper No. 3956

January 1992

JEL Nos. O30, L60

Productivity

This paper uses a newly available dataset on the R and D performance of individual French manufacturing firms for the 1980s to replicate and update a series of studies on French R and D and productivity growth at the firm level during the 1970s. We focus on a single dataset to evaluate the robustness of the methods commonly used to measure the private returns to R and D. We investigate the consequences of varying specifications and estimations, and in particular of using different measures of R and D (knowledge) capital and of double-counting corrections.

Our main findings are: First, having a longer history of R and D expenditures helps predict the productivity growth of firms, but the choice of depreciation rate for R and D capital makes little difference to the results. Second, the correction for double counting of R and D expenditures in capital and labor is important and converts a measured "excess" rate of returns to a total rate of return to R and D. Third, the direct production function approach to measuring the returns to R and D capital is preferred over the rate of returns variation that has been used in the past. Finally, the productivity of knowledge capital in the production function is uniformly positive, fairly robust, and correlated with permanent firm or industry effects.

Testing Trade Theory

Edward E. Leamer

NBER Working Paper No. 3957

January 1992

JEL Nos. F00, F10

International Studies

This review of the empirical literature in international microeconomics shows that data have had a disappoint-

ingly small effect on the intellectual lives of international economists. There are many and diverse reasons for this, but in general we need better balance between the issues, the theory, and the data. The profession as a whole is imbalanced in favor of theory. Most of the empirical work also is imbalanced. Some empirical studies take the theory too seriously and lose track of the issues. Others do not take the theory seriously enough and try to make do with ad hoc but inappropriate empirical models. Some studies lack both the theory and any clear issues.

A Model of the Optimal Complexity of Rules

Louis Kaplow

NBER Working Paper No. 3958

January 1992

JEL Nos. D82, K42

Law and Economics

Rules often are complex in order to distinguish different types of behavior that may have different consequences. Greater complexity allows better control of behavior. But individuals may need to incur costs ex ante to determine how complex rules apply to their contemplated conduct. Because of such costs, some individuals will choose not to learn complex rules. Also, applying complex rules ex post to determine applicable rewards or penalties is costly.

This paper models the effects of complexity on individuals' decisions to acquire information, choices about whether to act, and reports of their actions to an enforcement authority. It considers how optimal sanctions depend on the complexity of rules and determines when more complex rules will improve welfare.

Have Commercial Banks Ignored History?

Sule Özler

NBER Working Paper No. 3959

January 1992

JEL No. F34

International Studies

This paper investigates the impact of past defaults, and of recently acquired sovereignty, on the terms of bank loans for developing countries in the 1970s. I control for indicators of countries' repayment and for a measure of their political stability.

I find that: 1) The repayment difficulties prior to the 1930s do not have a statistically significant impact on the 1970s credit terms. In contrast, the defaults of the 1930s, and the postwar defaults and repayment difficulties, do have a statistically significant impact on credit terms. These findings are in contrast to those of studies that focused on crises in these markets. The results suggest that countries' repayment behavior influences their later market access. 2) Nations that achieved sovereignty recently were charged higher rates than nations that were sovereign before the 1940s. In fact, recently sovereign borrowers were charged rates as high as the defaulters of the former episodes were. This suggests that markets attach a risk premium for new institutions.

External Shocks, Politics, and Private Investment: Some Theory and Empirical Evidence

Sule Özler and Dani Rodrik

NBER Working Paper No. 3960

January 1992

JEL No. F43

International Studies

A key determinant of the response of private investment is how the political system responds to external economic shocks in developing countries. We look at a simple model of political-economic equilibrium to make this intuition more precise, and we develop a "political transmission mechanism." Even in the confines of this simple model, we find that ambiguities abound: domestic politics can magnify or dampen the effect of the external shock. In our empirical work, we find that a high level of urbanization magnifies the investment reduction in response to an external shock. This is consistent with the supposition that high levels of urbanization are conducive to distributive politics with pernicious economic effects. We also find that the provision of political rights is conducive to superior private investment behavior.

Bank Exposure, Capital, and Secondary Market Discounts on Developing Country Debt

Sule Özler and Harry Huizinga

NBER Working Paper No. 3961

January 1992

JEL No. F34

International Studies

Previous empirical studies of secondary market discounts for developing countries have ignored important creditor country factors. This paper indicates that, after controlling for repayment indicators of borrower countries, bank exposure and capital are important determinants of secondary market discounts: an increase in the exposure of large banks to a particular country leads to a decrease in the secondary market discounts on the debt of that country, while an increase in the capital of large banks leads to an increase in secondary market discounts. Among the repayment indicators of developing countries, only debt ratios are significant determinants of the discounts. We suggest that the impacts of exposure and capital can be explained by the presence of deposit insurance. The evidence on the stock market pricing of lender banks supports this view.

Social Security Rules and Marginal Tax Rates

Martin Feldstein and Andrew Samwick

NBER Working Paper No. 3962

January 1992

JEL Nos. H55, H24

Taxation

This paper shows how current Social Security benefit rules have created a variety of Social Security *net mar-*

ginal tax rates that differ by age, sex, dependency status, and income in ways that defy serious economic or social justification. The existing pattern of marginal rates distorts the incentive for each individual to work at different ages and the division of work within the household.

Although the net marginal rate of Social Security taxes is very low for some employees, and actually negative for substantial numbers of employees, the full statutory rate of 11.2 percent without any offsetting benefits applies to young workers, to women who will collect as dependents, and to the very poor. Modifications of existing rules could reduce some of the distorting incentives without changing the basic structure of the Social Security program or its overall net cost.

Women (whether currently married or single) who expect to collect benefits as dependents face the statutory marginal Social Security tax of 11.2 percent. In contrast, a typical 45-year-old man or woman who will collect benefits based on his or her own earnings faces a net marginal tax rate of 5.0 percent. A typical married man whose wife will collect benefits based on his earnings record faces a *negative* marginal Social Security tax rate of 2.1 percent. If the couple has a federal marginal income tax rate of 15 percent, the husband's combined marginal rate on additional earnings is 12.9 percent while the wife's combined marginal rate is 26.2 percent.

Net marginal Social Security tax rates decline sharply with age. For a man who will collect benefits for himself only, the rate falls from 6.7 percent at age 25 to 2.3 percent at age 60.

Workers with very low average lifetime earnings in "covered" employment (including those with other income in employment such as state and local government not covered by Social Security) face large negative marginal tax rates: a female with low "covered" earnings at age 45 faces a marginal tax rate of -13.7 percent, while a male with low "covered" earnings with a dependent spouse faces a marginal tax rate of -26.3 percent.

Taxation and Housing: Old Questions, New Answers

James M. Poterba
NBER Working Paper No. 3963
January 1992
Taxation

This paper shows how the tax reforms of the 1980s affected the incentives and distortions associated with tax policy toward housing markets. There are three principal conclusions: 1) Reductions in marginal tax rates, particularly for high-income households, reduced the tax-induced distortion in the user cost of owner-occupied housing. This lowered the deadweight losses associated with the favorable tax treatment of homeownership. 2) The increase in the standard deduction in the Tax Reform Act of 1986 (TRA86) removed from the ranks of itemizers several million middle-income homeowners who previously itemized. For these households, TRA86 raised the marginal cost of owner-occupied housing. TRA86 also exacerbated the regressive nature of the mortgage interest subsidy. In 1988, more than half of the tax losses associated with mortgage interest deductions accrued to the 8 percent of taxpayers with the highest eco-

crued to the 8 percent of taxpayers with the highest economic incomes. 3) TRA86 reduced incentives for investment in rental housing, contributing to the decline in new multifamily housing starts from 500,000 per year in 1985 to less than 150,000 in 1991. In the long run, these policies will lead to higher rents.

Rising Inequality? Changes in the Distribution of Income and Consumption in the 1980s

David M. Cutler and Lawrence F. Katz
NBER Working Paper No. 3964
January 1992
JEL Nos. I31, I32
Labor Studies

This paper examines changes in the distribution of income and consumption in the United States during the 1980s, using data from the Current Population Survey (income) and Consumer Expenditure Survey (consumption). We reach three primary conclusions. First, changes in the distribution of consumption parallel changes in the distribution of income. The lowest quintile of the consumption distribution received 0.9 percentage points less of total consumption in 1988 than in 1980; the corresponding decline for income was 0.6 percentage points.

Second, broad conclusions concerning recent changes in the consumption distribution are not very sensitive to the exact choice of a measure of family needs. Under a wide variety of alternative household equivalence scales, there is a widening in the consumption distribution in the 1980s. Third, the use of consumption measures of well-being in place of measures based on current money income does change conclusions concerning the extent of poverty in the United States. Using the official federal poverty thresholds, we find that the overall consumption poverty rate was three percentage points below the income poverty rate in 1988. Comparisons of the poverty rates of the elderly and the nonelderly are affected substantially by the choice of poverty measure. In 1988, the consumption poverty rate for the elderly was only 60 percent of the rate for adults, and one-third of the rate for children.

Twenty-Two Years of the NBER-ASA Quarterly Economic Outlook Surveys: Aspects and Comparisons of Forecasting Performance

Victor Zarnowitz and Phillip Braun
NBER Working Paper No. 3965
January 1992
JEL No. E27
Economic Fluctuations

The National Bureau of Economic Research, in cooperation with the American Statistical Association, conducted a regular quarterly survey of professional macroeconomic forecasters for 22 years beginning in 1968. The survey produced a mass of information about characteristics and results of the forecasting process. Many studies already have used some of this material, but this is the first comprehensive examination of all of it.

This report addresses several subjects and produces findings on each, as follows: 1) The distributions of error statistics across the forecasters: the dispersion among the individual predictions is often large and it typically increases with forecast horizon, as do the mean absolute (or squared) errors. 2) The role of the time-series properties of the target data: the more volatile the time series, the larger as a rule are the errors of the forecasts. 3) The role of revisions in "actual" data: forecast errors tend to be larger the greater the extent of the revisions. 4) Differences by subperiod: there is little evidence of an overall improvement or deterioration in forecasts between the 1970s and the 1980s. 5) Combining the individual forecasts into group mean or "consensus" forecasts: this generally results in large gains in accuracy. 6) Comparisons with a well-known macroeconomic model: the group forecasts are more accurate for most, but not all, variables and spans. 7) Comparisons with state-of-the-art time-series models: the group forecasts, and at least half of the individual forecasts, tend to outperform Bayesian vector autoregressive models in most (but not all) cases. The univariate ARIMA forecasts generally are the weakest.

The Budget and Trade Deficits

Aren't Really Twins

Martin Feldstein

NBER Working Paper No. 3966

January 1992

JEL Nos. F30, E60

Economic Fluctuations, International Studies, Taxation

Although the link between the U.S. budget deficit and trade deficit in the 1980s was so clear that the two were popularly labeled the twin deficits, it is wrong to generalize from the American experience of the 1980s to the conclusion that budget deficits and trade deficits are two sides of the same coin.

An increased budget deficit (or other reduction in national saving) must reduce either private investment or net exports, but the division between them depends on certain key parameters and on changes in the external environment. Although more than 90 percent of the decline in U.S. savings in the first half of the 1980s was offset by an increase in the international deficit and the associated capital inflow, this was not an inevitable result. Without the powerful incentives for business investment in the 1981 tax legislation, there might have been less investment and a smaller increase in the trade deficit.

The response to a reduction in national saving is not likely to be the same in the long run as in the short run. In my earlier studies with Charles Horioka and Philippe Bacchetta, I found that sustained differences in saving rates among developed countries lead to similar differences in investment rates. This paper updates the earlier analyses to the decade of the 1980s, and shows that among the G-7 countries the decade-average savings retention coefficient was 0.73, implying that nearly three-fourths of each additional dollar that was saved in a country remained in that country.

The United States now appears to be moving from the "short run," in which the capital inflow offsets a de-

cline in national saving, to the "long run," in which lower domestic saving reduces domestic investment. Although national saving in 1990 was an even smaller fraction of GNP than in 1986 (because of the decline in private saving), the capital inflow fell from a peak of 3.5 percent of GNP in 1987 to 1.7 percent of GNP in 1990. As a result, net private domestic investment was reduced to only about 3 percent of GNP in 1990.

On the Design and Reform of Capital Gains Taxation

Alan J. Auerbach

NBER Working Paper No. 3967

January 1992

JEL No. H21

Taxation

After reviewing recent work on the feasibility of taxing capital gains on accrual or in an equivalent manner, this paper develops and presents simulations of a model of household behavior, aimed at assessing the efficiency effects of this and other tax reforms. The model accounts for the portfolio choice and intertemporal consumption distortions that capital gains taxes induce under current law.

Among the simulation results are: 1) Eliminating the "lock-in" effect through a revenue-neutral move to accrual taxation causes national saving to decline, as households face a lower tax on present consumption from appreciated assets and, by reallocating existing wealth more efficiently, need to save less for future contingencies. Despite reducing saving, however, such a reform increases economic efficiency. 2) A simple reduction in the rate of capital gains taxation reduces national saving even for very high intertemporal elasticities of substitution, because of the additional income effect associated with reduced taxes on previously accumulated gains and the more efficient reallocation of existing wealth. However, making the tax cut prospective, although increasing saving, delays portfolio rebalancing and need not improve efficiency.

Menus of Linear Income Tax Schedules

Alberto Alesina and Philippe Weil

NBER Working Paper No. 3968

January 1992

JEL Nos. H21, E62

Taxation

By offering consumers a menu of linear income tax schedules instead of the traditional, piecewise linear income tax schemes, it is possible to increase government revenues. In the resulting equilibrium, consumers sort themselves out according to their (unobservable) productivity level. Those with high productivity choose the tax schedules with low marginal rates and high intercepts. This scheme extracts from the economy an unexploited source of revenue that, in contrast to standard supply-side proposals, does not depend on the economy being on the downward-sloping side of the Laffer curve.

Measuring the Aggregate Price Level: Implications for Economic Performance and Policy

Robert J. Gordon

NBER Working Paper No. 3969

January 1992

JEL Nos. E31, F30

Productivity

Inaccurate measures of the aggregate price level may distort short-run policy decisions and may produce misleading comparisons of productivity growth across decades and among nations. This paper compactly reviews the vast American literature on price and output measurement and identifies special aspects of American methods that affect international comparisons of inflation and output growth.

The traditional problem of substitution bias in the Consumer Price Index is of minor importance compared with the bias introduced by new products, changes in the quality of existing products, and outlet substitution. The quality bias for U.S. consumer durables recently has been estimated to be roughly 1.5 percent per year for the post-war period, and roughly 3 percent per year for producer durables. The only available study of outlet substitution bias estimates a 2 percent annual rate for food in the 1980s.

Cross-country differences in measurement methods tend to overstate the recent productivity performance of U.S. relative to European manufacturing, with an understatement for U.S. nonmanufacturing. Both European and U.S. manufacturing performance probably are understated relative to Japan, which seems to do the best job of incorporating new products and correcting for quality change of high tech goods

What Is Productivity: Capacity or Welfare Measurement?

Charles R. Hulten

NBER Working Paper No. 3970

January 1992

Productivity

A number of recent papers have examined the role of environmental variables in accounting for economic growth, and have concluded that net measures of national product are superior to gross measures in portraying the outcome of the growth process. This paper argues that the two measures are not substitutes, but complements, which reveal different aspects of economic growth: gross product is the output concept for estimating the structure of production, while net product is the correct concept for getting at the welfare consequences of economic growth. I then show that this capacity-welfare nexus is mirrored in the Hicksian and Harrodian definitions of technical change. I also present an alternative to the conventional Solow growth accounting framework in which the change in national wealth is decomposed into components corresponding to labor input and the Harrodian rate of technical change.

Growth Accounting When Technical Change Is Embodied in Capital

Charles R. Hulten

NBER Working Paper No. 3971

January 1992

Productivity

Many technological innovations are introduced through improvements in the design of new investment goods, thus raising the possibility that capital-embodied technical change may be a significant source of growth in total factor productivity. However, there are no systematic estimates of the size of the embodiment effect. To fill this gap, I merge estimates of quality change obtained from the price literature with a version of the conventional sources-of-growth model that allows for *both* embodied and disembodied technical change. My results suggest that as much as 20 percent of the total factor productivity growth in U.S. manufacturing from 1949–83 is attributable to the embodiment effect. Also, for the equipment used in U.S. manufacturing, best practice technology may be as much as 23 percent above the average level of technical efficiency.

The Intergenerational Mobility of Immigrants

Charles R. Hulten

NBER Working Paper No. 3972

January 1992

JEL No. J61

Labor Studies

This paper analyzes the intergenerational mobility of immigrants. Using the 1940–70 Censuses, the study reveals an important link between the earnings of immigrants and the earnings of their American-born children. Although there is some regression toward the mean, the earnings of second-generation Americans are affected strongly by the economic conditions in the source countries of their parents. Therefore, current immigration policy determines not only how immigrants perform in the labor market, but also future differences in the labor market experiences of American-born ethnic groups.

The Fall in Private Pension Coverage in the United States

David E. Bloom and Richard B. Freeman

NBER Working Paper No. 3973

January 1992

JEL No. J3

Aging, Labor Studies

This study documents the 1980s' fall in pension coverage and shows that it was concentrated most heavily on men, especially those who were young and less educated. We find that changes in real earnings and deunionization account for a sizable portion of the fall in pension coverage.

By contrast, there is little evidence that pension coverage fell because of a shift away from pensions to other forms of compensation. We also find little evidence that pension coverage declined because of institutional changes that reduced the attractiveness of pensions to employees or employers, with the possible exception of changes in the tax deductibility of contributions to Individual Retirement Accounts.

Liquidity Effects and the Monetary Transmission Mechanism

Lawrence J. Christiano and Martin S. Eichenbaum

NBER Working Paper No. 3974

January 1992

JEL Nos. E32, E44

Economic Fluctuations, Monetary Economics

Several recent papers provide strong empirical support for the view that an expansionary disturbance to monetary policy generates a persistent decrease in interest rates and a persistent increase in output and employment. However, existing quantitative general equilibrium models, which allow for capital accumulation, are inconsistent with this view. There *is* a recently developed class of general equilibrium models that can rationalize the contemporaneous response of interest rates, output, and employment to a money supply shock, but cannot rationalize *persistent* liquidity effects.

This paper discusses the basic frictions and mechanisms underlying this new class of models, and investigates one avenue for generating persistence. We argue that once a simplified version of the model in Christiano and Eichenbaum (1991) is modified to allow for extremely small costs of adjusting sectoral flow of funds, then positive money shocks will generate long-lasting, quantitatively significant liquidity effects, as well as persistent increases in aggregate economic activity.

Equilibrium Asset Prices with Undiversifiable Labor Income Risk

Philippe Weil

NBER Working Paper No. 3975

January 1992

JEL Nos. E44, G12

Asset Pricing

In a two-period Lucas tree economy, in which *ex ante* identical but *ex post* dissimilar agents face undiversifiable labor income risk, calibrating a (wrong) representative agent model results in overstating the equilibrium risk-free rate and understanding the equilibrium equity premium, if the utility function exhibits decreasing absolute risk aversion and prudence. As a consequence, these behavioral assumptions provide a theoretical rationale for the often-advanced conjecture that nontraded risk contributes to the solution of the puzzles regarding risk-free rate and equity premiums.

Precautionary Saving and Consumption Smoothing Across Time and Possibilities

Miles S. Kimball and Philippe Weil

NBER Working Paper No. 3976

January 1992

JEL Nos. E21, D11

Asset Pricing

This paper examines how risk aversion and intertemporal substitution determine the strength of the precautionary saving motive. We derive a measure of the strength of the precautionary saving motive for small risks that generalizes the concept of "prudence" to these more

general preferences. We show that for large risks, decreasing absolute risk aversion guarantees that the precautionary saving motive is stronger than risk aversion, regardless of the elasticity of intertemporal substitution. Holding risk preferences fixed, the extent to which the precautionary saving motive is stronger than risk aversion increases with the elasticity of intertemporal substitution. We derive sufficient conditions for the strength of the precautionary saving motive to decline with wealth, and for a change in risk preferences alone to increase the strength of the precautionary saving motive.

The Dynamics of Productivity in the Telecommunications Equipment Industry

G. Steven Olley and Ariel Pakes

NBER Working Paper No. 3977

January 1992

JEL Nos. D24, L11, L43, L64, C14

Industrial Organization, Productivity

Technological change and deregulation have caused a major restructuring of the telecommunications equipment industry over the last two decades. We estimate the parameters of a production function for that industry and then use those estimates to analyze the evolution of plant-level productivity over this period. The restructuring involved significant entry and exit, and large changes in the size of incumbents. Since firms' choices on whether to liquidate, and on the quantities of inputs demanded if they continue, depend on their productivity, we take into account the relationship between productivity on the one hand and input demand and survival on the other.

The algorithm we develop produces markedly different estimates of both production function parameters and productivity movements from traditional estimation procedures. We find an increase in the rate of industry productivity growth after deregulation. This is in spite of the fact that there was no increase in the average of the plants' rates of productivity growth, and that there actually was a fall in our index of the efficiency of the allocation of variable factors conditional on the existing distribution of fixed factors. However, deregulation was followed by a reallocation of capital toward more productive establishments (downsizing, and often shutdown, of unproductive plants, and disproportionate growth of productive establishments) that more than offset the other factors' negative impacts on aggregate productivity.

The Impact of Collective Bargaining Legislation on Disputes in the U.S. Public Sector: No Policy May Be the Worst Policy

Janet Currie and Sheena McConnell

NBER Working Paper No. 3978

January 1992

JEL No. J53

Labor Studies

This paper estimates the impact of collective bargaining legislation on disputes during labor negotiations in the U.S. public sector. We use a large national sample

ple of U.S. state and local government contracts to compare the incidence and intensity of disputes by similar workers under different forms of collective bargaining legislation. The breadth of our data allows us to examine the impact of five different forms of legislation. Our principal finding is that strike costs, measured by strike duration and the number of working days lost, are highest in jurisdictions that provide no explicit framework for bargaining or dispute resolution.

Information Spillovers, Margins, Scale, and Scope: With an Application to Canadian Life Insurance

Jeffrey I. Bernstein

NBER Working Paper No. 3979

January 1992

JEL Nos. G22, D24

Productivity

This paper develops a model of the production of life insurance service. It focuses on price-setting ability and on the cost advantages of size and diversity. The model characterizes insurers' decisions about the face value and number of policies, and about the number of insurance lines.

I apply the model to Canadian life insurance firms. Price-cost margins average from 13 percent to 40 percent. These margins emanate from information spillovers generated by marketing activities. Cost advantages attributable to size are small, but those attributable to diversity are substantial. Returns to scale average 1.13 to 1.40, while returns to scope average 70% to 100%.

Sectoral Shifts and Unemployment in Interwar Britain

S. Lael Brainard

NBER Working Paper No. 3980

January 1992

JEL Nos. N14, N34, E32

Labor Studies

This paper measures the importance of sectoral shifts, as opposed to aggregate shocks and changes in search intensity, in explaining the persistent high unemployment that prevailed in interwar Britain. By using the cross-section variation in sectoral stock market excess returns over time, I develop a new measure of sectoral shifts that captures the arrival of information about reallocation shocks. This new series accounts for roughly one-quarter of the average level of aggregate unemployment during the interwar period, even after I control for a variety of shocks to aggregate demand. It also explains roughly one-half of the variation in unemployment. This suggests an important role for sectoral shifts.

State Infrastructure and Productive Performance

Catherine J. Morrison and Amy Ellen Schwartz

NBER Working Paper No. 3981

January 1992

JEL Nos. O30, H70

Productivity

The recent literature on productivity growth has focused on the impact of investment in public infrastruc-

ture on the performance of firms. The size of this impact has important implications for policymakers' decisions to invest in public capital, and for productivity analysts' evaluation of productivity growth fluctuations and declines. However, detailed evaluation of the impact of infrastructure is difficult with existing studies that rely on restricted models of firms' technology and behavior.

In this paper, we construct a more comprehensive model of firms' production and input decisions. We then apply our framework to state-level data on the output production and input (capital, nonproduction and production labor, and energy) use of manufacturing firms. We find that infrastructure investment provides a significant benefit to manufacturing firms and thus augments productivity growth. However, we also show that the social cost of such capital (which is not reflected in firms' costs), and the indirect impact resulting from scale effects, should be taken into account.

Price Margins and Capital Adjustment: Canadian Mill Products and Pulp and Paper Industries

Jeffrey I. Bernstein

NBER Working Paper No. 3982

January 1992

JEL Nos. L06, C05

Productivity

This paper estimates a model that incorporates non-competitive behavior in product and factor markets and makes capital accumulation subject to adjustment costs, so that firms are not constrained to be in long-run equilibrium. I apply the model to two major Canadian manufacturing industries: pulp and paper, and mill products. For both industries, in each of the three product markets and in the wood input market, I find competitive behavior. In addition, the industries are not in long-run equilibrium, as marginal adjustment costs cause marginal profit to exceed the rental rate on capital.

Given the short-run competitive behavior in product and factor markets, I derive new estimates for scale economies and rates of technological change. Unlike the results of others, I find that both industries exhibit small-scale economies and positive rates of technological change.

Disinflation with Imperfect Credibility

Laurence M. Ball

NBER Working Paper No. 3983

February 1992

JEL Nos. E31, E32

Economic Fluctuations, Monetary Economics

This paper presents a theory of the real effects of disinflation. As in New Keynesian models, price adjustment is staggered across firms. As in New Classical models, credibility is imperfect: the monetary authority may not complete a promised disinflation. The combination of staggering and imperfect credibility yields more plausible results than either of these assumptions alone. In particular, an announced disinflation reduces expected output if credibility is sufficiently low.

Do Tougher Licensing Provisions Limit Occupational Entry? The Case of Dentistry

Morris M. Kleiner and Robert T. Kudrle

NBER Working Paper No. 3984

February 1992

JEL No. J44

Labor Studies

This study examines the role of occupational licensing for dentistry: an occupation with standards that vary by state. First we closely replicate Freeman's work on labor market cobwebs, by using national data to examine purely market phenomena in the determination of training for the dental profession. Then we approximate the government barrier to practicing dentistry by adding a weighted average pass rate on the state exam to the previous model. Next, we use pooled cross-section time-series analysis to explore with state-level data the market determinants of entry into a profession. Finally, we supplement these results with measures of entry restrictiveness by statute and pass rate. Our most consistent evidence suggests that a higher failure rate in state licensing deters entry into dental practice.

Pensions and Wage Premiums

Edward Montgomery and Kathryn Shaw

NBER Working Paper No. 3985

February 1992

JEL No. J30

Labor Studies

We use the theory of compensating differentials to identify sources of heterogeneity in firms' costs of providing fringe benefits, and hence heterogeneity in the magnitude of the compensating differential. We estimate the relationship between pensions and wages, controlling for variations in the size of the compensating differential related to firm size or the presence of a union. Both firm size and unionism commonly are associated with the payment of wage premiums and/or the presence of market power, in which the costs of fringe benefits to the firm may be less. Our results are consistent with these a priori expectations and suggest that the magnitude of the compensating differential is significantly higher in nonunion and in small firms than in other firms.

Transitional Dynamics in Two-Sector Models of Endogenous Growth

Casey B. Mulligan and Xavier Sala-i-Martin

NBER Working Paper No. 3986

February 1992

Growth

In this paper, we analyze the steady-state and transitional dynamics of two-sector models of endogenous growth. We describe necessary conditions for endogenous growth that allow us to reduce the dynamics of the solution to a system with one statelike and two control-like variables. We then analyze the determinants of the long-run growth rate.

We use the Time-Elimination Method to analyze the transitional dynamics of the models. We find that there are transitions in real time if the point-in-time production

possibility frontier is strictly concave. This occurs, for example, if the two production functions are different, or if there are decreasing point-in-time returns in any of the sectors.

We also show that if the models have a transition in real time, then they are stable. We find that the wealth, or consumption-smoothing, effect tends to dominate the substitution, or real-wage, effect; the transition from relatively low levels of physical capital is carried over through high work effort rather than through high savings.

We show that the models predict *conditional convergence*: that is, in a cross section, the growth rate is negatively related to initial income but only after human capital is held constant. Thus, the models are consistent with existing empirical cross-country evidence.

The Consequences and Costs of Maternal Substance Abuse in New York City: A Pooled Time-Series, Cross-Section Analysis

Theodore J. Joyce, H. Naci Mocan,

and Andrew D. Racine

NBER Working Paper No. 3987

February 1992

JEL No. I1

Health Economics

We use a pooled time-series, cross-section analysis of live births in New York City between 1980 and 1989 to investigate the dramatic rise in low birthweight, especially among blacks, that occurred in the mid-1980s. After controlling for other risk factors, we estimate that there were from 1900 to 3800 additional low-birthweight births attributable to illicit substance abuse over this period, resulting in excess neonatal admission costs of between \$22 and \$53 million. We conclude that illicit substance use was a major contributory factor in the rapid rise of low birthweight among blacks in New York City in the latter part of the 1980s. The impact of prenatal illicit substance use on whites and Hispanics is less conclusive.

Forward into the Past: Productivity Retrogression in the Electric Generating Industry

Robert J. Gordon

NBER Working Paper No. 3988

February 1992

JEL Nos. C33, O30, O47

Productivity

The electric utility industry is a prime culprit in the slowdown of U.S. productivity growth during the last two decades. This paper develops econometric equations for labor and fuel demand for a large panel dataset covering almost all fossil-fueled electric generating capacity from 1948-87. Labor productivity and fuel efficiency both advanced rapidly until the late 1960s, then reversed direction, deteriorating substantially, particularly for newly constructed plants.

This research goes beyond econometric estimation by conducting telephone interviews with plant managers of establishments that registered particularly high or low

productivity. The interviews reveal many variables and relationships that are omitted in conventional econometric studies of production. They support the view that the productivity reversal originated in the manufacturing industry that produces electric generating equipment; after decades of increased scale, temperature, and pressure, a "technological frontier" was reached in which new large plants developed unanticipated maintenance problems requiring substantial additions of maintenance employees. Environmental regulations also contributed to the productivity reversal but were secondary in importance to the technological barriers. Overall, the study supports the "depletion hypothesis" previously advanced to explain the productivity slowdown.

Intertemporal Asset Pricing Without Consumption Data

John Y. Campbell

NBER Working Paper No. 3989

February 1992

JEL Nos. G12, E21

Asset Pricing, Economic Fluctuations

This paper proposes a new way to generalize the insights of static asset pricing theory to a multiperiod setting. The consumption-wealth ratio depends on the elasticity of intertemporal substitution in consumption; asset risk premiums are determined by the coefficient of relative risk aversion. Risk premiums also are related to the covariances of asset returns with the market return, and with news about the discounted value of all future market returns.

The Cowles Commission Approach, Real Business Cycle Theories, and New Keynesian Economics

Ray C. Fair

NBER Working Paper No. 3990

February 1992

JEL No. E10

Economic Fluctuations

I review and compare the Cowles Commission approach to the approaches of real business cycle (RBC) theorists and New Keynesian economists. I argue that RBC models are not tested in a serious enough way, and that the New Keynesian literature is not empirical enough for testing even to be a serious possibility. Macroeconomics seems to be moving away from its traditional empirical basis, which is sad. This paper argues for returning to the path that was abandoned by most macroeconomists around 1970: the specification and testing of structural macroeconomic models.

Wage Effects of a U.S.-Mexican Free Trade Agreement

Edward E. Leamer

NBER Working Paper No. 3991

February 1992

JEL Nos. F14, F15

International Studies

Mexico doesn't seem economically large enough now

to have a significant effect on the prices of goods and the earnings of labor in the United States. But Mexican population growth and productivity gains induced by liberalization will make the Mexico of the future much larger than Mexico today, especially in those sectors that use its intensively abundant low-skilled labor. Furthermore, in a free trade agreement with the United States, Mexico has an incentive to concentrate production on those sectors that are most protected by the United States from third-country competition, and to export all that product to the high-priced, protected U.S. market. For all of these reasons, the Mexico of the future is large enough to undo current or future U.S. protection designed to maintain wages of low-skilled workers. With or without a free trade agreement, the United States faces a substantial problem with the continuing economic deterioration of the lowest-skilled workers. A free trade agreement with Mexico would keep the United States from using protectionism to deal with this problem.

Dynamic Efficiency, the Riskless Rate, and Debt Ponzi Games Under Uncertainty

Olivier Jean Blanchard and Philippe Weil

NBER Working Paper No. 3992

February 1992

JEL Nos. H63, G12, E62

Asset Pricing, Economic Fluctuations

Can governments roll their debt over forever in dynamically efficient economies, and thus avoid the need to raise taxes? While the answer is a clear "no" under certainty, under *uncertainty* it depends on whether public debt provides intergenerational insurance. When it does not, rollover is not possible, even if the rate of return on one-period bonds is below the growth rate. When it does, debt rollover may be possible, even if the return on one-period bonds is above the growth rate.

Geographical Localization of Knowledge Spillovers as Evidenced by Patent Citations

Rebecca Henderson, Adam B. Jaffe,

and Manuel Trajtenberg

NBER Working Paper No. 3993

February 1992

JEL Nos. O33, R11

Productivity

We compare the geographic location of patent citations to those of the cited patents, as evidence of the extent to which knowledge spillovers are localized geographically. We find that citations to U.S. patents are more likely to come from the United States and more likely to come from the same state and Standard Metropolitan Statistical Area (SMSA) as the cited patents than one would expect based only on the preexisting concentration of related research activity. These effects are particularly significant at the local (SMSA) level, and are particularly apparent in early citations.

Human Capital Accumulation and Income Distribution

Raquel Fernandez and Richard Rogerson

NBER Working Paper No. 3994

February 1992

JEL Nos. E2, I2, H4

This paper analyzes the extent to which education will be subsidized when the subsidy rate is determined by majority vote. The analysis takes place in a framework in which education is a discrete decision, and all individuals would like to obtain an education because of its effect on future earnings. Individuals differ in their initial income levels. The lack of credit markets implies that initial income is a determinant of who actually obtains an education. We consider the outcome of a process in which income is taxed to provide subsidies for education, and taxes are chosen by majority vote. We characterize the outcome as a function of both the level and the distribution of income in the economy. In particular, we derive conditions under which middle-income individuals ally themselves with upper-income individuals at the expense of lower-income individuals, and vice versa. The analysis determines the relationship between human capital accumulation and distribution of income.

Why Does the Stock Market Fluctuate?

Robert B. Barsky and J. Bradford De Long

NBER Working Paper No. 3995

February 1992

JEL Nos. E44, G12

Asset Pricing

Large long-run swings in the U.S. stock market over the past century correspond to swings in estimated values of fundamentals, calculated by using a long moving average of past dividend growth to forecast future growth rates. Such a procedure would have been reasonable if investors were uncertain of the structure of the economy, and had to make forecasts of unknown, and possibly changing, long-run dividend growth rates. The parameters of the stochastic process followed by dividends over the twentieth century cannot be estimated precisely even today at the century's end. In the past investors had even less information about the dividend process. In such a context, it is difficult to see how investors can be faulted for implicitly forecasting future dividends by extrapolating past dividend growth.

Local versus Global Convergence

Across National Economies

Steven N. Durlauf and Paul A. Johnson

NBER Working Paper No. 3996

February 1992

JEL Nos. O40, O47

Economic Fluctuations, Growth

This paper reexamines the ability of Solow-type growth models to explain the pattern of cross-country growth rates. Recent authors, most notably Mankiw, Romer, and Weil (1990), have argued that differences in national growth rates are compatible with the view that each country has access to a common, neoclassical aggregate production function. Those authors' models imply that, conditional on population growth and savings

rates, disparate economies are converging over time to the same level of per capita output.

We argue that cross-country growth is explained better by a model of local versus global convergence. Countries converge locally in the sense that economies with similar initial conditions tend to converge. However, we find little evidence of convergence across economies with substantially different initial conditions as measured by per capita output or literacy rates. Further, the impact of capital formation on aggregate output increases with the level of economic development. These results are consistent with models of multiple equilibria in long-run behavior. Our results suggest that the Solow growth model should be supplemented with a theory of aggregate differences in the production function in order to explain international growth patterns fully.

The Effect of the Minimum Wage on the Fast Food Industry

Lawrence F. Katz and Alan B. Krueger

NBER Working Paper No. 3997

February 1992

Labor Studies

Using data from a longitudinal survey of fast food restaurants in Texas, we examine the impact of recent changes in the federal minimum wage on a low-wage labor market. Our main conclusions are: 1) Less than 5 percent of fast food restaurants use the new youth subminimum wage, even though the vast majority paid starting wages below the new hourly minimum immediately before it went into effect. 2) Although some restaurants increased wages by more than was necessary to comply with higher minimum wages in both 1990 and 1991, recent increases in the federal minimum wage have compressed the distribution of starting wages in the Texas fast food industry greatly. 3) Employment increased relatively in those firms likely to have been affected most by the 1991 minimum wage increase. 4) Changes in the prices of meals appear to be unrelated to mandated changes in wages. These employment and price changes do not seem consistent with conventional views of the effects of increases in a binding minimum wage.

Privatization in East Germany

Hans-Werner Sinn

NBER Working Paper No. 3998

February 1992

JEL Nos. H82, P11, L33

This paper is a critical review of East German privatization policy. I argue that the restitution of old property rights has been a major obstacle to investment, and that the attempt to sell two-thirds of an economy in the marketplace is bound to be a failure. Such an attempt implies serious macroeconomic and microeconomic stock-flow problems that erode the sales prices of Treuhand assets, induce the Treuhand to slow down its sales, and reduce private investment. By combining a participation model with a wage freeze, I design a social contract that may help increase the chances of economic recovery in East Germany.

Taxation and Inequality: A Time-Exposure Perspective

Joel B. Slemrod

NBER Working Paper No. 3999

February 1992

Public Economics

Conclusions about inequality based on cross-sectional snapshots of annual income can give a misleading picture of the inequality of a more permanent notion of income, because individuals are mobile across annual income classes. This paper reassesses some of the issues about taxation and inequality using two longitudinal tax return databases.

Replacing annual income with "time-exposure" income, defined as average real income over the period, does not reduce the measured degree of inequality significantly in 1979–85, although the fraction of income received by the lowest earners increases substantially. However, the procedure does reduce the contribution to inequality of certain sources of income, such as capital gains, and does increase the contribution of other sources, such as interest and dividends. There is no systematic evidence that the comparison of snapshots between 1967–73 and 1979–85 overstates the growth in inequality of a more permanent notion of income. The inequality of pretax income has been increasing steadily in the past two decades. Changes in income taxation have neither stemmed nor contributed significantly to this trend; since 1980 the contribution of the income tax to decreasing inequality has declined slightly.

The Flow Approach to Labor Markets

Olivier Jean Blanchard and Peter Diamond

NBER Working Paper No. 4000

February 1992

JEL Nos. E24, J3, J6

Economic Fluctuations

The flow approach to labor markets builds on the flows of workers and jobs. It is based on three essential components: a specification of labor demand in terms of flows of job creation/destruction; a process of matching between workers and firms; and a process of wage determination in which wages depend on the labor market prospects of employed workers and firms.

We think that this approach gives the right basic picture of unemployment and unemployment dynamics, and of the relationship between wage movements and the state of the labor market. The additional richness it delivers also captures important implications of labor market mechanisms for macroeconomics. Finally, its structure is realistic enough to allow for a productive interaction with—and use of—micro work and micro evidence in both labor and product markets.

Bretton Woods and Its Precursors: Rules versus Discretion in the History of International Monetary Regimes

Alberto Giovannini

NBER Working Paper No. 4001

February 1992

JEL Nos. E42, E43, E52, F31, F33, N23, N24, N21, N22
International Studies

In recent years, the theory of rules and discretion in

monetary policy has fascinated scores of academic economists and policymakers. This paper asks whether the theory can be applied to the history of the world monetary system, by focusing on the setup and the experience of the Bretton Woods regime and comparing it with its predecessors, particularly the classical gold standard.

First I discuss the underpinnings, and some of the problems, of a theory of the evolution of the international monetary regime based on alternating rules and discretion. Then I assess the ability of such theories to explain the historical record. I review the rules that characterized the classical gold standard, and the motivations to return to gold in the interwar period. Then I evaluate the British and U.S. plans for world monetary reform published in 1943, and the International Monetary Fund Articles of Agreement. Finally, I analyze the data on interest rates and exchange rates during the classical gold standard and the Bretton Woods period to assess the stabilizing properties of the two exchange rate regimes.

Self-Selection and Internal Migration in the United States

**George J. Borjas, Stephen G. Bronars,
and Stephen J. Trejo**

NBER Working Paper No. 4002

February 1992

JEL Nos. J60, R23

Labor Studies

This paper empirically analyzes internal migration flows using data from the National Longitudinal Surveys of Youth. The theoretical approach highlights regional differences in the returns to skills: regions that pay higher returns to skills attract more skilled workers than regions that pay lower returns. Our results suggest that interstate differences in the returns to skills are a major determinant of both the size and the skill composition of internal migration flows. Persons whose skills are most mismatched with the reward structure offered by their current state of residence are those most likely to leave that state; they tend to relocate in states that offer higher rewards for their particular skills.

Peso Problems and Heterogeneous Trading: Evidence from Excess Returns in Foreign Exchange and Euromarkets

Martin D. D. Evans and Karen K. Lewis

NBER Working Paper No. 4003

February 1992

Asset Pricing, International Studies

Both theoretical and empirical studies have treated excess returns as processes with disturbances that vary over time but are temporary. By contrast, the empirical evidence indicates that the behavior of asset price levels can be approximated well by processes with some permanent disturbances. These two observations restrict the relationship between the levels of asset prices and the excess returns that they generate.

We begin by testing these restrictions for foreign ex-

restrictions for some returns, implying that excess returns contain some permanent shocks. We then evaluate the possible reasons for these results. We test and reject a simple model implied by a steady-state presence of traders with regressive expectations. However, we cannot distinguish between a model in which the effects of these traders vary over time and a model in which a peso problem exists, or both.

Asset Bubbles and Endogenous Growth

Gene M. Grossman and Noriyuki Yanagawa

NBER Working Paper No. 4004

February 1992

JEL Nos. O41, G12, E21

Growth

We study the interaction between productive and non-productive savings in an economy that grows in the long run because of endogenous improvements in labor productivity. As in the neoclassical growth setting with overlapping generations studied by Tirole (1985), asset bubbles can exist in an economy with endogenous growth, provided that they are not too large and that the growth rate in the equilibrium without bubbles exceeds the interest rate. Since the growth rate in the equilibrium without bubbles is endogenous, the existence condition reflects parameters of tastes and technology. We find that bubbles, when they exist, retard the growth of the economy, perhaps even in the long run, and reduce the welfare of all generations born after the bubble.

Business Cycle Durations and Postwar Stabilization of the U.S. Economy

Mark W. Watson

NBER Working Paper No. 4005

March 1992

JEL Nos. N10, E32

Economic Fluctuations, Monetary Economics

The average length of U.S. business cycle contractions fell from 20.5 months in the prewar period to 10.7 months in the postwar period. Conversely, the average length of business cycle expansions rose from 25.3 months in the prewar period to 49.9 months in the postwar period. This paper investigates three explanations for this apparent "duration stabilization": 1) Shocks to the economy have been smaller in the postwar period. This implies that there should be duration stabilization in both aggregate and sectoral output. 2) The composition of output has shifted from sectors that are very cyclical, such as manufacturing, to sectors that are less cyclical, such as services. This would lead to increased stability in aggregate output even in the absence of increased stability in the individual sectors. 3) The apparent stabilization is largely spurious, and is caused by differences in the way that prewar and postwar business cycle reference dates were chosen by the NBER. This paper favors the third explanation.

Inflation and Poverty

Eliana A. Cardoso

NBER Working Paper No. 4006

March 1992

International Studies

This paper discusses the regressive nature of the inflation tax and its limited impact on individuals below the poverty line. I argue that inflation affects poverty mainly through its impact on real wages: the empirical evidence shows that, in Latin America, wages increase more slowly than prices during episodes of rising inflation. Finally, I discuss whether some stabilization programs are less costly than others in terms of increased poverty. Both orthodox programs and attempts to reduce inflation by implementing incomes policy have not helped the poor in Latin America.

Debt Reduction, Adjustment Lending, and Burden Sharing

Ishac Diwan and Dani Rodrik

NBER Working Paper No. 4007

March 1992

JEL Nos. F34, O19

International Studies

We argue that the disincentive effect of a debt overhang generally is small. Consequently, debt reduction does not lead to important efficiency gains. We then develop a framework that highlights the inefficiency created by the liquidity constraint of overindebted countries. Often, adjustment/investment opportunities that are profitable at the world interest rate cannot be undertaken for lack of sufficient funds. New creditors are deterred from investing, as they expect to be "taxed" by the old creditors who stand to gain disproportionately. This leads to an inefficient situation: a class of new creditors has a comparative advantage over the old creditors. We focus on the time inconsistency introduced by the liquidity shortage. New (unconditional) loans will be consumed rather than invested. In this context conditional lending can release the liquidity constraint and lead to efficiency gains that can be shared among the debtor, the old creditors, and the new creditors. Debt reduction then will create the "headroom" needed for these new and more efficient creditors to step in.

Do Taxes Matter? Lessons from the 1980s

Joel B. Slemrod

NBER Working Paper No. 4008

March 1992

JEL No. H20

Public Economics

The response of the economy to two major—although, in important respects, offsetting—tax reforms has been much smaller than ardent supply-side revolutionaries expected. This paper first discusses how the evidence from the tax reforms of 1981 and 1986 reflects on our understanding of the response to taxation, referring in particular to savings and capital gains realizations. I then reconstruct a 1992 view about how taxes affect behavior.

One unifying theme in the paper is that the tax system does much more than alter the relative prices of real variables. It also provides incentives for misreporting income, restructuring financial claims, timing transactions, changing the legal form of organization, and so on. Because of this, observed low tax elasticities of real variables may be caused either by low elasticities of substitution or by the fact that tax policy changes our opportunities in complex ways. Disentangling these explanations requires an emphasis on the transaction-based nature of the tax system and on the administration and enforcement of tax laws.

Auditing the Producer Price Index: Micro Evidence from Prescription Pharmaceutical Preparations

Ernst R. Berndt, Zvi Griliches, and Joshua G. Rosett
NBER Working Paper No. 4009
March 1992
JEL Nos. C43, C81, L65
Productivity

We focus on a mystery we uncovered while undertaking a detailed audit of the U.S. Bureau of Labor Statistics (BLS) producer price index (PPI): From January 1984 through December 1989, the BLS price index for SIC 28341 (prescription pharmaceutical preparations) grew at an annual rate of 9.09 percent. For comparison, we obtained monthly price and quantity sales data on all prescription pharmaceutical preparation products sold by four major U.S. pharmaceutical manufacturers, accounting for about 24 percent of total industry domestic sales in 1989. Using Laspeyres price index construction procedures on these data that mimic the BLS methods, we find that the four-company price index increased at only 6.68 percent per year over the same period. When we employ a Divisia price index procedure with smoothed weights that incorporates new goods immediately, the aggregate price index for these four firms grows at a rate of only 6.03 percent per year. Why does the official BLS price index grow approximately 50 percent more rapidly (9.09 percent versus 6.03 percent) than the Divisia price index?

High Tech Capital Formation and Labor Composition in U.S. Manufacturing Industries: An Exploratory Analysis

**Ernst R. Berndt, Catherine J. Morrison,
and Larry S. Rosenblum**
NBER Working Paper No. 4010
March 1992
JEL Nos. O33, O47
Productivity

We report the results of an exploratory empirical effort to examine the relationship between investments in high tech information technology capital and the distribution of employment, both by occupation and by level of educational attainment. Our data cover two-digit U.S. manufacturing industries annually from 1968–86.

We find that increases in the high tech composition of

capital (OF/K) are related positively to growth in white collar, nonproduction worker hours. Increases in white collar hours account for most of the reduction in aggregate labor productivity associated with increases in high tech capital.

Within blue collar occupations, we find skill upgrading toward more educated workers occurring along with increases in OF/K. We find that, among white collar occupations, hours provided by the least and most educated workers increase with OF/K, while hours provided by those with high school and some college education are affected adversely.

The Growth and Welfare Consequences of Differential Tariffs with Endogenously Supplied Capital and Labor

Philip L. Brock and Stephen J. Turnovsky
NBER Working Paper No. 4011
March 1992
JEL Nos. F11, F13
International Studies

This paper analyzes the impact of differential tariffs on consumption and investment in a small open economy where capital is accumulated over time. We highlight the cost of the intertemporal distortions produced by protective trade policies and obtain several specific welfare propositions. First, tariff protection creates short-run benefits but long-run costs to welfare. Second, we characterize the second-best policy for the two tariffs. Finally, we derive several propositions summarizing the implications of our analysis for tariff reform.

Suit versus Settlement When Parties Seek Nonmonetary Judgments

Steven Shavell
NBER Working Paper No. 4012
March 1992
JEL No. K41
Law and Economics

This paper considers situations in which plaintiffs seek nonmonetary judgments: for instance, the custody of a child, or an injunction. When will parties be likely to settle, and what will the nature of their settlements be?

The answers to these questions are different from when plaintiffs seek purely monetary awards. In that case, settlements involve only money payments; here they involve disposition of the nonmonetary things sought. Also, when plaintiffs seek monetary judgments, the parties will be inclined to settle to save litigation costs and to reduce risk, if they agree about the likelihood of plaintiff success at trial. In nonmonetary judgments, that is not necessarily true. For example, custody of a child may well be considered vital by each parent, making each unwilling to relinquish the chance of securing custody through trial for any amount in the range of what the other could pay.

Detection of Bid Rigging in Procurement Actions

Robert H. Porter and J. Douglas Zona

NBER Working Paper No. 4013

March 1992

JEL Nos. L12, D44, L74

Industrial Organization

This paper examines bidding in auctions for state highway construction contracts on Long Island in the early 1980s, in order to determine whether bid rigging occurred. Detection of collusion is possible because of limited participation in the collusive scheme. We look at differences in behavior between ring members and non-members. In these auctions, collusion did not take the form of a bid rotation scheme, in which only one ring member submitted a bid. Instead, several ring members bid on most jobs. The apparent role of ring meetings prior to the auction was to designate a serious bidder, and that firm's bid. The other firms then frequently submitted phony higher bids. The bidding data indicate that the bids of noncartel firms, as well as their distribution, were related to cost measures, such as how much backlog a firm was carrying. In contrast, the rank distribution of higher cartel bids was unrelated to similar cost measures, and differed from the distribution of the low cartel bid.

A Procedure for Predicting Recessions with Leading Indicators: Econometric

Issues and Recent Experience

James H. Stock and Mark W. Watson

NBER Working Paper No. 4014

March 1992

JEL Nos. E17, C32

Economic Fluctuations

This paper examines the forecasting performance of various leading economic indicators and composite indexes since 1988, in particular during the onset of the 1990 recession. The primary focus is on an experimental recession index (XRI), a composite index that provides probabilistic forecasts of whether the U.S. economy will be in a recession six months hence. After detailing its construction, we examine the out-of-sample performance of the XRI and a related forecast of overall economic growth: the experimental leading index (XLI). These indexes performed well from 1988 through the summer of 1990—for example, in June 1990 the XLI model forecast a 0.4 percent (annual rate) decline in the experimental coincident index from June through September, when in fact the decline was only slightly greater: 0.8 percent. However, the XLI failed to forecast the sharp declines of October and November 1990. After exploring several possible explanations, we conclude that one important source of the forecast error was the use of financial variables during a recession that was not associated with particularly tight monetary policy. Financial indicators—and the experimental index—were not alone, however, in failing to forecast the 1990 recession. An examination of 45 economic indicators shows that almost all failed to forecast the 1990 downturn, and the few that did provided unclear signals before the recessions of the 1970s and 1980s.

Monetary Policy and Credit Conditions: Evidence from the Composition of External Finance

**Anil K. Kashyap, Jeremy C. Stein,
and David W. Wilcox**

NBER Working Paper No. 4015

March 1992

Monetary Economics

We use the relative movements in bank loans and commercial paper to show the existence of a loan supply channel of monetary policy transmission. For monetary policy to work through a lending channel, banks must view loans and securities as imperfect substitutes, so that monetary tightening affects the availability of bank loans. We find that tighter monetary policy leads to a shift in firms' mix of external financing—commercial paper issuance rises, while bank loans fall, suggesting that loan supply indeed has been reduced. Furthermore, these shifts in the financing mix seem to affect investment (even controlling for interest rates). This implies that bank and nonbank sources of finance also are not perfect substitutes for businesses. We then argue that this view of the transmission mechanism can help to explain why interest rate spreads involving commercial paper rates have had considerable predictive power for many measures of economic activity.

The European Central Bank: A Bank or a Monetary Policy Rule

David Folkerts-Landau and Peter M. Garber

NBER Working Paper No. 4016

March 1992

International Finance and Macroeconomics

Since a central banking institution will be an essential feature of the European Economic and Monetary Union, the EC Committee of Central Bank Governors recently produced a Draft Statute of the European System of Central Banks and the European Central Bank (ECB). The draft statute mandates the maintenance of price stability as the explicit primary objective of the ECB; the necessary monetary functions and operations of the system are defined in accordance with standard practice. However, maintenance of a stable financial and payments system is not an explicit objective of the ECB, and only limited banking functions are among its tasks.

The draft statute clearly subscribes to a "narrow" concept of the System of Central Banks with a single objective—monetary stability—rather than a "broad" concept with the additional objective of financial market stability. This paper examines the consequences of such a "narrow" central banking system for EC financial markets. We conclude that, in the absence of such banking functions, it will be necessary to slow or even prevent the ongoing development of EC-wide liquid, securitized financial markets, supported by a large-volume wholesale payments system. Instead, the historically prevalent bank-intermediated financial system will have to be maintained to lower the likelihood of liquidity crises that demand central bank intervention.

The Private ECU: A Currency Floating on Gossamer Wings
David Folkerts-Landau and Peter M. Garber
NBER Working Paper No. 4017
March 1992
International Finance and Macroeconomics

The value of the private ECU today is driven by expectations that a European monetary authority at some future date will declare itself willing to convert private ECUs into the official basket at par. Until then, ECU value is not limited by any existing institutional arrangements in the European Communities, such as the Exchange Rate Mechanism of the European Monetary System. We ask what determines the exchange rate between the private ECU and the official basket, and what determines ECU interest rates. The Bank for International Settlements sets the ECU overnight interest rate on clearing balances as a weighted and lagged average of the money market rates in the EC currencies. In that way, it fixes a point on the ECU term structure. This exogenous fixing of the ECU interest rate, and the expectation of a future fixing of the exchange rate, satisfy the fundamental requirements for obtaining a determinate real value of what otherwise is an undefined private ECU unit of account.

Inflation Expectations and the Structural Shift in Aggregate Labor Cost Determination in the 1980s

Jonathan S. Leonard and David Neumark
NBER Working Paper No. 4018
March 1992
JEL Nos. E27, E31, F30, J30, E50
Labor Studies

Aggregate equations tended to overpredict inflation in labor costs in the United States during the 1980s. We consider whether a change in the price-inflation-expectations mechanism explains this apparent structural shift in the 1980s.

We ask whether the sharp recession of the early 1980s, and continued tight monetary policy throughout the decade, may have led to changes in the relationship between past and expected price inflation, ultimately leading to overprediction of labor cost inflation. We reject this hypothesis and conclude instead that there was a true structural shift in labor cost determination.

Sources of Bias in Women's Wage Equations: Results Using Sibling Data

Sanders Korenman and David Neumark
NBER Working Paper No. 4019
March 1992
JEL Nos. D13, J12, J13, J16, J71
Labor Studies

We use data on sisters to jointly address heterogeneity and endogeneity bias in estimates of wage equations for women. We find biases in estimated wage equations for white and black women. Some biases can be detect-

ed only when both sources of bias are assessed simultaneously. For both white and black women, there is upward bias in the estimated returns to schooling. Bias-corrected estimates of the effect of marriage on wages for white women suggest a positive marriage premium.

Energy Tax Credits and Residential Conservation Investment

Kevin A. Hassett and Gilbert E. Metcalf
NBER Working Paper No. 4020
March 1992
JEL Nos. H24, H31, Q42
Public Economics

The irreversible nature of investment in residential energy conservation in the face of price uncertainty means that there is a value to waiting to invest (an option value). This helps to explain the low rate of investment in conservation that resulted from the residential energy tax credit. Simulations suggest that a tax credit such as the one implemented from 1978-85 will not increase investment in conservation significantly.

However, using data from roughly 38,000 individual tax returns over a three-year period, 1979-81, we find that the energy tax credit is statistically significant in explaining the probability of investing. Our estimates suggest that increasing the federal credit by 10 percentage points would increase the households claiming the credit from 5.7 percent to 7.1 percent.

The Effects of Tax-Based Saving Incentives on Government Revenue and National Saving

Martin Feldstein
NBER Working Paper No. 4021
March 1992
JEL Nos. H2
Public Economics

This paper shows that previous analyses of IRA-type plans have miscalculated their effect on tax revenue, and therefore on national saving, by ignoring their impact on corporate tax payments. Recognizing the effect of IRA plans on corporate tax revenue can change previous conclusions in fundamental ways. The revenue loss associated with IRAs is either much smaller than has been estimated, or is actually a revenue gain, depending on the time horizon and key parameter values.

In addition to analyzing the effects of traditional tax-deductible IRA plans, this paper presents an alternate nontaxable IRA (in which contributions are not deductible and no subsequent tax is levied on earnings or withdrawals). I show that, for the most plausible parameter values, the net revenue effect is positive in every year.

Although each individual participant eventually withdraws all contributions and accumulated earnings from the IRA, the net impact on the national capital stock remains positive even after the individual's death because of the favorable cumulative effects on tax revenue. This is true for traditional deductible IRA plans as well as for the nontaxable IRAs.

Learning from the Reagan Deficits

Benjamin M. Friedman

NBER Working Paper No. 4022

March 1992

JEL Nos. H62, E62

Economic Fluctuations, Monetary Economics

This paper draws six observations from the U.S. fiscal policy actions of the 1980s and their apparent macroeconomic aftermath. In each case, it focuses on implications for familiar debates about economic behavior. First, across-the-board cuts in personal income tax rates reduced the government's tax revenues. Second, reducing tax revenues did not restrain government spending, at least not by enough to avoid the emergence of historically large deficits. Third, greater government deficits did not result in greater private saving. Fourth, greater deficits did result in—or at least coincided with—higher real interest rates. Fifth, deficits did result in reduced private investment. Sixth, greater deficits also resulted in lower net foreign investment.

Firm-Specific Determinants of the Real Wage

Janet Currie and Sheena McConnell

NBER Working Paper No. 4023

March 1992

Labor Studies

Bargaining models suggest that firm-specific variables play an important role in wage determination. Yet previous empirical studies of wage determination largely have ignored these variables. Our analysis of a large panel dataset of U.S. wage contracts suggests that firm-specific variables suggested by bargaining models, such as the value of sales, the capital-labor ratio, and the financial liquidity of the firm, are important determinants of negotiated real wages.

Maximizing Seigniorage Revenue During Temporary Suspensions of Convertibility: A Note

Michael D. Bordo and Angela Redish

NBER Working Paper No. 4024

March 1992

JEL Nos. E31, N11

Development of the American Economy, Monetary Economics

This paper extends the theory of the revenue-maximizing rate of monetary growth to the case of a temporary suspension of convertibility. It also suggests a methodology for the interpretation of monetary behavior during historical periods of inconvertibility. First we analyze the case of a government with a monopoly over currency issue. The government maximizes seigniorage revenue by generating an inflation, but the terminal condition of a return to convertibility implies that the price level must drop at the point of suspension of convertibility, so that there is no discontinuity at the date of resumption. Then we consider the behavior of a private banking system whose monetary liabilities are temporarily inconvertible. We use the model to interpret monetary behavior during the suspension of convertibility by U.S. banks in 1837–8.

A Cross-Sectional Test of a Production-Based Asset Pricing Model

John H. Cochrane

NBER Working Paper No. 4025

March 1992

Asset Pricing

This paper tests a factor pricing model for stock returns. The factors are returns on physical investment, inferred from investment data via a production function. The tests examine the model's ability to explain the variation in expected returns across assets and over time. The model is not rejected: it performs about as well as the CAPM and the Chen, Roll, and Ross factor model, and substantially better than a simple consumption-based model. In comparison tests, the investment return factors drive out all the other models.

The paper also provides an easy technique for estimating and testing dynamic, conditional asset pricing models: include factors and returns scaled by instruments in an unconditional estimate. This procedure imposes none of the usual restrictions on conditional moments and does not require prewhitened or orthogonalized factors.

The Inconsistency of Common Scale Indicators When Output Prices Are Unobserved and Endogenous

Zvi Griliches and Tor Jakob Klette

NBER Working Paper No. 4026

March 1992

JEL Nos. C23, D24

Productivity

This paper explores the inconsistency of common scale estimators when output is proxied by deflated sales, based on a common output deflator across firms. The problems arise when firms operate in an imperfectly competitive environment and prices differ between firms. In particular, the scale estimates will tend to be biased downward in the production function case, under a wide range of assumptions about the pattern of technology, demand, and factor price shocks. This result also holds for scale estimates obtained from cost functions.

We present various empirical estimates of scale economies for a sample of Norwegian manufacturing plants. Our findings provide some support for the hypothesis that firms face an imperfectly competitive environment. There are significant markups and scale economies to the variable factors of production in our sample. However, our estimates of markups and scale economies are substantially lower than the results obtained by Hall (1988, 1990) and others using industry-level data.

Training, Wage Growth, and Job Performance: Evidence from a Company Database

Ann P. Bartel

NBER Working Paper No. 4027

March 1992

Labor Studies

Using the personnel records of a large manufacturing

firm, I study the relationships between on-the-job training, wages, and job performance. Having a company database avoids the biases that generally result when individuals are unable to recall accurately the amount of training they received, and/or when definitions of training vary across diverse firms.

My main findings are: 1) Controlling for days spent in formal training programs reduces the returns to tenure by 18 percent. 2) Both first-difference and fixed-effects models of wage growth show that training has a positive and significant effect on wage growth. 3) Training leads to an improvement in job performance, as measured by performance rating scores.

Convertible Bonds as "Back-Door" Equity Financing

Jeremy C. Stein

NBER Working Paper No. 4028

March 1992

Corporate Finance

I argue that corporations may use convertible bonds as an indirect (albeit possibly risky) method of getting equity into their capital structures in situations in which adverse selection problems make conventional stock issues unattractive. Unlike other theories of convertible bond issuance, my model highlights the importance of call provisions on convertibles, and the significance of costs of financial distress to the information content of a convertible issue.

National Origin and Immigrant Welfare Reciprocity

George J. Borjas and Stephen J. Trejo

NBER Working Paper No. 4029

March 1992

JEL Nos. J61, I30

Labor Studies

This paper explores the relationship between differences in national origin and welfare reciprocity by immigrants to the United States. We find that a few source country characteristics explain over two-thirds of the variance in welfare reciprocity rates across national origin groups. Changes in the average source country characteristics of the foreign-born population between 1970 and 1980 explain most of the rise in immigrant welfare use that occurred over the decade.

Unemployment Insurance Taxes and the Cyclical and Seasonal Properties of Unemployment

David Card and Phillip B. Levine

NBER Working Paper No. 4030

March 1992

JEL No. J65

Labor Studies

We combine microdata for 1979-87 from the Current Population Survey with a newly assembled database of tax rates for the unemployment insurance system to

measure the effects of imperfect experience rating on temporary layoffs and other types of unemployment. We find a strong negative association between the degree of experience rating and the rate of temporary layoff unemployment. The largest effect is in recessionary years, the smallest effect in expansionary years. Increases in the degree of experience rating also are associated with damped seasonal fluctuations in temporary layoffs, particularly in construction and durable manufacturing. The correlation between the degree of experience rating and the unemployment rate of permanent job losers is smaller but also negative, whereas the correlation with the unemployment rate of job quitters and reentrants is negligible. Attempts to control for the endogeneity of unemployment insurance taxes are consistent with a causal interpretation of our findings.

Diminished Expectation of Nuclear War and Increased Personal Savings: Evidence from Individual Survey Data

Bruce Russett and Joel B. Slemrod

NBER Working Paper No. 4031

March 1992

JEL Nos. E21, H56

Economic Fluctuations, Public Economics

At the end of 1983, Gallup polls showed that 52 percent of Americans thought that the probability of a world war in the next ten years was 50 percent or higher; by 1989, the percentage had dropped to 29 percent. Such pervasive fear of war is bound to have an effect on decisions about present-versus-uncertain-future consumption.

This paper investigates the cross-sectional relationship between saving and fear of war. Using responses to telephone surveys conducted during April and October 1990, we show that an individual's professed level of fear about the likelihood of nuclear war is significantly negatively related to: the probability of being a saver rather than a dissaver; changes in actual saving; and saving plans relative to actual savings. Fear of war has an independent effect, controlling for many demographic, economic, and psychological characteristics.

These results are broadly consistent with other evidence on the relationship between aggregate saving and fear of war, both over time and across countries.

College Scholarship Rules and Private Saving

Martin Feldstein

NBER Working Paper No. 4032

March 1992

JEL Nos. I22, D12

Public Economics

This paper examines the effect of existing college scholarship rules on the incentive to save. I show that families eligible for college scholarships face "education tax rates" on capital income of between 22 percent and 47 percent, in addition to regular state and federal income taxes. The scholarship rules also impose an annual tax on previously accumulated assets. Through the combination of the implied tax on capital income and the

associated tax on previously accumulated assets, the scholarship rules that apply to a middle-income family reduce the value of an extra dollar of accumulated assets by 30 cents in four years. A similar family with two children who attend college in succession will see an initial dollar of assets reduced to 50 cents.

Such capital levies of 30 to 50 percent are a strong incentive not to save for college expenses but to rely instead on financial assistance and even on regular market borrowing. Moreover, since any funds saved for retirement also are subject to these education capital levies, the scholarship rules discourage retirement saving as well as saving for education.

The empirical analysis developed here, based on the 1986 Survey of Consumer Finances, implies that these incentives do have a powerful effect on the actual accumulation of financial assets. More specifically, I estimate that the scholarship rules induce a typical household with a head aged 45, two precollege children, and income of \$40,000 a year, to reduce accumulated financial assets by \$23,124, approximately 50 percent of what would have been accumulated without the adverse effect of the scholarship rules.

The Bretton Woods International Monetary System: A Historical Overview

Michael D. Bordo

NBER Working Paper No. 4033

March 1992

JEL Nos. E50, F02, F33, N20

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

This paper presents an overview of the Bretton Woods experience from a historical perspective. I analyze its performance relative to other international monetary regimes, its origins, its operation, its problems, and its demise. I emphasize issues that were deemed important at the time, and I raise questions that may be of interest for the present.

Part 2 compares the macro performance of Bretton Woods with preceding and subsequent monetary regimes. The descriptive statistics on nine key macro variables point to one startling conclusion: the Bretton Woods system, in its full convertibility phase from 1959–71, was the most stable regime for both nominal and real variables in the past century.

Part 3 surveys the origins of Bretton Woods: the perceived problems of the interwar period; the plans for a new international monetary order; and the steps leading to the outcome: the Articles of Agreement. Part 4 examines the preconvertibility period from 1946–58; the problems in getting the system started, including the dollar shortage and the weakness of the International Monetary Fund; and how the system evolved to convertibility and the gold dollar standard.

Part 5 analyzes the heyday of Bretton Woods, 1959–71, in the context of the gold dollar standard and the three famous problems: adjustment, liquidity, and confidence. Part 6 considers the emergence of a de facto dollar standard in 1968 and its collapse in the face of a massive U.S.-induced inflation. Part 7 considers why Bretton Woods was so stable and yet so short-lived. It also considers the importance of adherence to credible rules in the design of an effective international monetary

Differential Effects of Post-School Training on Early Career Mobility

Lisa M. Lynch

NBER Working Paper No. 4034

March 1992

Labor Studies

What factors influence the probability of new entrants to the labor market leaving their first job after completing school? I consider the differential effects of company-provided training, apprenticeships, and training received off-the-job from for-profit proprietary institutions. I pay particular attention to how the effects of training vary by race, gender, and educational attainment. I show that the majority of company-provided training spells begin after an employee has been with an employer for at least one year, while the majority of off-the-job training spells begin during the first year with an employer. Overall, there is no significant gender difference in the probability of leaving the first employer. Company-provided training results in a lower probability of leaving an employer, while off-the-job training increases the probability of leaving the first employer. Both of these effects are especially strong for women.

Near-Rationality, Heterogeneity, and Aggregate Consumption

Ricardo J. Caballero

NBER Working Paper No. 4035

March 1992

JEL Nos. E21, E32

Economic Fluctuations

The simple permanent-income model provides a good description of the medium-long-run behavior of aggregate consumption of nondurables, but fails to describe short-run behavior. I present a model that simultaneously explains the observed excess smoothness of consumption to wealth innovations, the excess sensitivity of consumption to lagged income changes, and the conditional asymmetries found in the data.

Testing for Price Anomalies in Real Estate Auctions

Orley C. Ashenfelter and David Genesove

NBER Working Paper No. 4036

March 1992

JEL No. G1

Asset Pricing, Industrial Organization

We report the results of an auction of 83 condominium apartment units in New Jersey. At the auction, every unit was "hammered down." But, unknown to the 2348 registered bidders, 40 percent of the sales fell through. In the subsequent sale of condominium units in face-to-face negotiations, identical units sold for 13 percent less than they fetched at auction, and the discount was largest for those units hammered down early in the auction. These results are inconsistent with the usual predictions from the theory of common value auctions. They suggest that uninformed bidders in this auction may have been the subject of a "winner's curse," which generated considerable profit for the seller.

Training at Work: A Comparison of U.S. and British Youths

David G. Blanchflower and Lisa M. Lynch

NBER Working Paper No. 4037

March 1992

Labor Studies

This paper compares and contrasts the structure of post-school training for young people without university degrees in Britain and the United States. We use two unique longitudinal surveys to examine four issues: the extent of post-school training in both countries, and the wage gains associated with it; the link between formal training and further qualifications in Britain, and its impact on wages; differentials in the training experience by gender in the two countries; and, the possible implications for skill development in Britain of dismantling significant elements of the traditional apprenticeship system.

We find that youths without college degrees in Britain receive much more post-school training than similar youths in the United States. This training also is linked with higher nationally recognized qualifications. The rates of return to post-school training are high in both countries, but especially in the United States. This is consistent with the underinvestment in training in the United States. When we divide the sample by gender, however, we find that U.S. women receive more training than their British counterparts, and their wages increase by a greater amount as a result. As Britain has replaced the traditional apprenticeship system with a government-led program called Youth Training, more women seem to be receiving training after school. However, far fewer young people are obtaining qualifications after their training.

Regional Growth and Migration:

A Japan-U.S. Comparison

Robert J. Barro and Xavier Sala-i-Martin

NBER Working Paper No. 4038

March 1992

Growth

Using two regional datasets on 47 Japanese prefectures and 48 U.S. states, we find clear evidence of convergence: that is, poor prefectures and states grow faster than rich ones do. We also find both intraregional and interregional convergence. When we study the determinants of the rates of regional immigration, we find striking similarities in the two countries. In both, the reaction of net immigration rates to income is slightly above 0.25. This indicates a slow (although very significant) population adjustment to income differentials. We do not find that population movements explain convergence across economies.

Conceptually Based Measures of Structural Adaptability

Kala Krishna and Alwyn Young

NBER Working Paper No. 4039

March 1992

International Trade and Investment

This paper defines and measures the adaptability of an economy to exogenous changes in product prices,

factor availability, and technological change. We argue that, in general, flexibility can be defined only relative to the exogenous changes that occur. Using a dual approach, we develop measures of flexibility in response to the particular exogenous shock. We also decompose the total change in National Income into its components, including gains caused by flexibility, or losses caused by inflexibility.

Moscow Black Markets and Official Markets for Foreign Exchange: How Much Flexibility in Flexible Rates?

Linda S. Goldberg

NBER Working Paper No. 4040

March 1992

International Finance and Macroeconomics

Flexible exchange rate systems often are not recommended for countries undergoing economic transition. In late 1989, the former Soviet Union instituted exchange rate flexibility on the limited share of international enterprise transactions channeled through the auction, and later on interbank markets for trade in foreign currency. This paper details the regulatory evolution of the system and analyzes the impact of announced and implemented policy initiatives on two sets of flexible exchange rates observed in Moscow: the exchange rates instituted through foreign currency auctions and interbank markets, and black market exchange rates on dollar-ruble trade.

Initially, the auction and interbank currency structure was a mechanism for a steady real depreciation of the ruble. Thereafter, the ruble was pegged in real terms at a level initially equal to the black market exchange rate. This peg persisted until the end of 1991, when government central bank foreign exchange reserves were depleted, and the crawling peg apparently was abandoned. Throughout the sample, patterns in black market exchange rates contrasted sharply with those of auction rates. Black market rates exhibited greater real variability and sharp speculative swings.

Incumbent Behavior: Vote Seeking, Tax Setting, and Yardstick Competition

Timothy Besley and Anne C. Case

NBER Working Paper No. 4041

March 1992

JEL No. H71

Public Economics

This paper analyzes tax competition when voters use the tax policy of neighboring jurisdictions as information on the performance of their incumbent politicians. We show that this process has implications both for voter tolerance of high taxes and for tax setting. Using two different tax datasets, we confirm the importance of neighbors' taxes both on the probability of incumbent reelection and on tax-setting behavior.

"New" Trade Theory and Policy a Decade Old: Assessment in a Pacific Context

J. David Richardson

NBER Working Paper No. 4042

April 1992

JEL No. F1

International Trade and Investment

This paper characterizes and evaluates what has been called variously the new, new view, strategic, or industrial organization approach to international trade and trade policy. This approach analyzes trade in "strategic environments" in which small numbers of large, self-consciously interdependent agents interact, and in which their activities themselves are linked interdependently (strategically). The new view's perspectives have been controversial, but often because they have been misunderstood. Many of the new view's subtler strengths have remained hidden.

Empirical Testing of Asset Pricing Models

Bruce N. Lehmann

NBER Working Paper No. 4043

April 1992

JEL Nos. G10, G11, G12

Asset Pricing

This essay reviews the literature on empirical testing of asset pricing models. I describe the kinds of asset pricing models typically tested, and explicate their economic implications, in terms of both the estimation of relevant parameters and tests of their implied restrictions. I also discuss pertinent aspects of the available data on security prices and macroeconomic variables. I conclude with an examination of selected aspects of the current empirical state of asset pricing theory.

A Test of Negotiation and Incentive Compensation Models Using Longitudinal French Enterprise Data

John M. Abowd and Francis Kramarz

NBER Working Paper No. 4044

April 1992

JEL Nos. J33, J31

Labor Studies

We model the determinants of firm-level wages and employment, allowing explicitly for firm and worker heterogeneity. Our firms have three types of workers (cadres, skilled, and unskilled) and may choose explicitly from among three distinct contracting regimes (strong form efficiency, labor demand/right to manage, and incentive contracting). We apply the model to a representative sample of 1097 French enterprises for 1978-87. We find that firms with enterprise level agreements appear to implement incentive contracts. This is significant because a firm-level agreement is voluntary in France. On the other hand, firms without accords appear to make labor demand decisions using the sector-level agreement as the relevant wage rate. Efficient contracts

are dominated by the other two contractual possibilities. External wage rates, which we estimate for each group of workers within each firm, do not seem to influence employment decisions in the manner predicted by efficient contracts regardless of the accord status of the firm.

On the Growth Effects of Import Competition

Richard E. Baldwin

NBER Working Paper No. 4045

April 1992

JEL Nos. F10, O40

Growth, International Trade and Investment

This paper shows that the market structure of an economy's research sector is an important determinant of the aggregate growth rate, even though it has been ignored until now in the new growth literature. To make this point in a concrete context, I use a simple model to show that import competition may stimulate growth by reducing the market power of domestic innovators. Specifically, import competition forces domestic innovators to choose between either quickening their pace of innovation or being displaced by foreign innovators. The pro-growth effect of import competition increases welfare. This paper considers a number of policy implications, including the growth effects of antitrust policy, partial liberalization, and trade in intellectual property rights.

Union Threat Effects and Nonunion Industry Wage Differentials

David Neumark and Michael L. Wachter

NBER Working Paper No. 4046

April 1992

JEL Nos. J31, J50

Labor Studies

We investigate the impact of union strength on changes in nonunion wages and employment. The prevailing model in this area is the threat model, which predicts that increases in union strength cause increases in nonunion wages and decreases in nonunion employment. In testing the threat model, we also test two alternatives: the crowding and complements models. We find that decreases in the percentage organized (reflecting a declining union threat) are associated with increases in the nonunion wage. Furthermore, increases in union wages appear to decrease, rather than increase, nonunion wages. The evidence on the determinants of intraindustry variation in nonunion wage premiums is somewhat more consistent with the crowding model, and is strikingly consistent with the complements model of union and nonunion wage determination. Further evidence on the determinants of intraindustry variation in nonunion employment is consistent with the complements model and the threat model: movements in nonunion industry employment are negatively related to changes in proxies for union strength. Thus, the combined evidence supports the complements model, but not the threat model nor the crowding model.

Devaluation Controversies in the Developing Countries: Lessons

from the Bretton Woods Era

Sebastian Edwards and Julio A. Santaella

NBER Working Paper No. 4047

April 1992

JEL No. F2

International Finance and Macroeconomics

This paper uses historical data from the Bretton Woods era to analyze the effectiveness of devaluation-based adjustment programs in the developing countries. We investigate in detail 48 major devaluations undertaken between 1954 and 1971 in an effort to understand the circumstances leading to these adjustment programs, as well as their degree of effectiveness. An important aspect of the analysis is the distinction between devaluations undertaken within the context of International Monetary Fund (IMF) programs and devaluations implemented independently. We find that, in general, countries with lower income per capita and deeper economic problems tended to seek IMF support more frequently. Also, countries with left-leaning governments were less likely to embark on IMF programs. With respect to the effectiveness of these devaluation programs, we find that devaluations accompanied by restrictive and consistent macroeconomic policies are an efficient and powerful adjustment tool. Also, in general, countries that embarked on IMF standby programs tended to perform better than countries that adjusted on their own.

Adoption of Technologies with Network Effects: An Empirical Examination of the Adoption of Automated Teller Machines

Garth Saloner and Andrea Shepard

NBER Working Paper No. 4048

April 1992

JEL No. L00

Industrial Organization

The literature suggests that the value of a network is affected positively by the number of geographically dispersed locations it serves (the "network effect") and the number of users (the "production scale effect"). We show that a firm's expected time to adoption of technologies with network effects *declines* with the number of both users and locations. Our empirical evidence on automated teller machines (ATMs) is consistent with this prediction. We find that a bank's date of adoption of an ATM decreases according to the number of its branches (a proxy for the number of locations, and hence for production scale economies). The network effect is the larger of the two effects.

Sources of Output Fluctuations During the Interwar Period: Further Evidence

on the Causes of the Great Depression

Stephen G. Cecchetti and Georgios Karras

NBER Working Paper No. 4049

April 1992

Monetary Economics

This paper decomposes output fluctuations between 1913 and 1940 into those resulting from aggregate supply shocks and aggregate demand shocks. We estimate a number of different models, all of which yield qualitatively similar results. While identification normally is achieved by assuming that aggregate demand shocks have no long-run real effects, we also estimate models that allow demand shocks to affect output permanently. Our findings support three conclusions: 1) there was a large negative aggregate demand shock in November 1929, immediately after the stock market crash; 2) aggregate demand shocks are mainly responsible for the decline in output through mid- to late 1931; 3) beginning in mid-1931, there is an aggregate supply collapse that coincides with the onset of severe bank panics.

Is Japan Creating a Yen Bloc in East Asia and the Pacific?

Jeffrey A. Frankel

NBER Working Paper No. 4050

April 1992

JEL Nos. F15, F36

International Finance and Macroeconomics,
International Trade and Investment

This paper reaches seven conclusions about the Yen Bloc that Japan is reputedly forming in Pacific Asia: 1) The *level* of trade in East Asia is biased intraregionally, as it is within the European Community and the Western Hemisphere, to a greater extent than can be explained naturally by distance. These regions might be called "supernatural" blocs, in contrast to Krugman's "natural" trade blocs. 2) There is no evidence of a special Japan effect. 3) Once there is proper accounting for rapid growth in Asia, the statistics do not bear out a *trend* toward intraregional bias of trade flows. 4) The world's strongest trade grouping includes the United States and Canada along with the Asian/Pacific countries (that is, APEC). 5) There is somewhat more evidence of rising Japanese influence in East Asia's *financial markets*. Tokyo appears to have acquired significant influence over interest rates in a few Asian countries, although its influence overall is no greater than that of New York. 6) Some of Japan's financial and monetary influence occurs through a growing role for the yen, at the expense of the dollar. The yen has become relatively more important in exchange rate policies and in the invoicing of trade and finance in the region. 7) This trend is less the outcome of Japanese policymakers' wishes than of pressure from the U.S. government to internationalize the yen.

Noncooperative Equilibria in Regional Environmental Policies When Plant Locations Are Endogenous

**James R. Markusen, Edward R. Morey,
and Nancy Olewiler**

NBER Working Paper No. 4051

April 1992

JEL Nos. F1, H3, H7, Q2

International Trade and Investment

We present a two-region model in which an imperfectly competitive firm produces a good with increasing returns at the plant level, and there are shipping costs between the two markets. Production of the good causes local pollution, and regional governments can levy pollution taxes or impose environmental regulations. The firm decides, partly on the basis of these environmental policy variables, whether to maintain plants in both regions, serve both regions from a single plant, or shut down. A noncooperative equilibrium in regional environmental policies occurs when each region chooses the policy that maximizes its welfare, given the policy in the other region.

We then document two types of harmful tax (regulatory) competitions. If the disutility of pollution is high enough, each region will want the polluting good produced only in the other region. The two regions likely will compete by increasing their environmental taxes (standards) until the polluting firm is driven from the market. Alternatively, if the disutility from pollution is not as great, each region will realize that its welfare could decrease if its environmental policy causes the firm not to operate in the region. In this case, the regions usually will compete by undercutting the other's pollution tax rates (environmental standards).

Interest Differentials Under Fixed and Flexible Exchange Rates: The Effects of Capital Controls and Exchange Risk

Richard C. Marston

NBER Working Paper No. 4053

April 1992

JEL No. F31

International Finance and Macroeconomics

This paper examines evidence on interest differentials under the Bretton Woods system of fixed exchange rates and under the flexible rate system that succeeded it. Under the Bretton Woods system, many countries resorted to capital controls in an attempt to pursue independent monetary policies. In the three major countries studied in this paper—Britain, Germany, and the United States—these capital controls resulted in large differentials between national interest rates covered for exchange risk. The capital controls and resulting interest differentials distorted many cross-border investment and borrowing decisions.

I compare these covered interest differentials with uncovered interest differentials in the Eurocurrency markets, which are free of capital controls. In both fixed and flexible periods, average uncovered differentials between Eurodollar interest rates and four other Eurocurrency rates in most cases are close to zero. So, these average uncovered interest differentials, whether attributable to exchange risk premiums or to forecast errors, are much smaller than average covered interest differentials between national markets because of capital controls. If exchange risk premiums have significant effects on uncovered interest differentials in some periods, then these premiums must vary with time, with a mean close to zero over the long sample periods studied. Similarly, if forecast errors have systematic components in some periods, then these errors have a mean close to zero as well, in the long sample periods studied.

Does the Human Capital/Educational Sorting Debate Matter for Development Policy?

Kevin Lang

NBER Working Paper No. 4052

April 1992

JEL No. J50

Labor Studies

If education increases human capital, then subsidizing education can generate economic growth and combat poverty. Estimates suggest that education is a good social investment. In sorting models, the return to education in part reflects the information about productivity that a worker's education reveals. Thus, the social and private returns diverge. If we believe the sorting model, we should be less swayed by evidence that estimated returns to education exceed the social discount rate, and therefore less likely to support education-based development policies. This conclusion is incorrect.

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