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# NBER Reporter

NATIONAL BUREAU OF ECONOMIC RESEARCH, INC.

SUMMER 1988

## Program Report

### NBER Research on Japan

Geoffrey Carliner

As Japan's role in the world economy has grown in recent years, the NBER has focused increasing attention on economic relations between the United States and Japan and on the functioning of the Japanese economy. This report summarizes recent NBER research on Japanese trade balances, exchange rates, competitiveness, and labor markets. It concludes with a description of ongoing projects in this area.

#### Macroeconomic Causes of Trade Balances

Because Japan needs to earn money to pay for imports of oil and other raw materials, its trade balance with the United States and most other developed countries has been in surplus for many years. However, until the early 1980s, the overall current accounts of both countries were roughly in balance. Since then, the U.S. trade deficit has skyrocketed and Japan's overall surplus has grown dramatically as well.

Most economists believe that trade balances are determined by macroeconomic factors, such as national saving rates and international capital flows. An increase in the government budget deficit may tend to decrease national saving, and thus increase the trade deficit. Indeed, William F. Branson and Martin Feldstein have found that the very large appreciation of the dollar relative to the yen and other currencies between 1981 and 1985, and the huge U.S. trade deficit that ensued, was in part the result of the dramatic rise of the U.S. government budget deficit.<sup>1</sup> Kazuo Ueda, Ryuzo Sato, and

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This issue of the *Reporter* highlights the Bureau's research in economic relations between the United States and Japan. Next, Kevin Lang describes his work on over- and underemployment and David Romer discusses his studies of nominal price rigidity. After the quarterly Economic Outlook Survey are biographical sketches, news of NBER conferences, the Conference Calendar, and other NBER news and reports. The *Reporter* concludes with short summaries of recent NBER Working Papers.

John A. Rizzo confirmed that a major cause of the increase in Japan's current account surplus was the decrease in its government budget deficit; the decrease in Japan's rate of domestic private investment was also important.<sup>2</sup>

Rachel McCulloch also has emphasized that the excess of Japan's saving over investment has led to large

<sup>1</sup>W. H. Branson, "Sources of Misalignment in the 1980s," in *Misalignment of Exchange Rates*, R. C. Marston, ed. Chicago: University of Chicago Press, 1988; and M. Feldstein, "The Budget Deficit and the Dollar," in *NBER Macroeconomics Annual, Volume 1*, S. Fischer, ed. Cambridge, MA: The MIT Press, 1986.

<sup>2</sup>K. Ueda, "Perspectives on the Japanese Current Account Surplus," in *NBER Macroeconomics Annual, Volume 3*, S. Fischer, ed. Cambridge, MA: The MIT Press, forthcoming; R. Sato and J. A. Rizzo, "The Other Side of the Trade Imbalance: What Will Japan Do?" *NBER Working Paper No. 2111*, December 1986; and R. Sato, "The U.S.-Japan Trade Imbalance from the Japanese Perspective," *NBER Working Paper No. 2479*, January 1988.

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capital outflows and current account surpluses. Paul R. Krugman analyzed the effect of declining energy prices on Japan's trading patterns.<sup>3</sup>

Malcolm D. Knight and Paul R. Masson have found that changes in fiscal policy significantly affected current account balances in the United States, Germany, and Japan. On the other hand, B. Douglas Bernheim found no significant effect of Japanese fiscal policy on its current account balance for 1960-84, perhaps because of tight government controls on capital flows during most of this period. For the United States, however, Bernheim estimated that a \$1 increase in the budget deficit was associated with an increase of about 30 cents in the U.S. current account deficit.<sup>4</sup>

In papers with Naoko Ishii and Warwick J. McKibbin, Jeffrey D. Sachs has shown that U.S. and Japanese fiscal policies do affect current account balances. However, Japan's fiscal policy has had little effect on the U.S. current account. This suggests that there is little potential for international coordination of fiscal policies as a way of reducing the U.S. trade imbalance. While each country can affect its own trade balance through macroeconomic policy, changes in the fiscal policies of Japan and other countries will have relatively little effect on the U.S. trade balance. Feldstein and Stanley Fischer, in separate papers, reached similar conclusions.<sup>5</sup>

## Causes and Effects of Exchange Rate Fluctuations

In part, fiscal policies affect current account balances through their effect on exchange rates. But other factors also play a large role in determining exchange rate fluctuations. Takatoshi Ito has shown that Japanese capital controls created differentials between interest rates in Tokyo and in overseas European markets prior to 1980. These controls impeded the outflow of capital from Japan and tended to raise the value of the yen. After they were relaxed in December 1980, the interest rate differential narrowed.

John H. Makin and Raymond D. Sauer found that monetary policies in the United States and Japan also

<sup>3</sup>R. McCulloch, "U.S.-Japan Economic Relations," *NBER Working Paper No. 2408, October 1987*; and P. R. Krugman, "Is the Japan Problem Over?" *NBER Working Paper No. 1962, June 1986*.

<sup>4</sup>M. D. Knight and P. R. Masson, "Fiscal Policies, Net Saving, and Real Exchange Rates: The United States, the Federal Republic of Germany, and Japan," in *International Aspects of Fiscal Policies*, J. A. Frenkel, ed. Chicago: University of Chicago Press, 1988; and B. D. Bernheim, "Budget Deficits and the Balance of Trade," in *Tax Policy and the Economy, Volume 2*, L. H. Summers, ed. Cambridge, MA: The MIT Press, 1988.

<sup>5</sup>N. Ishii, W. J. McKibbin, and J. D. Sachs, "Macroeconomic Interdependence of Japan and the United States: Some Simulation Results," *NBER Working Paper No. 1637, June 1985*; W. J. McKibbin and J. D. Sachs, "Coordination of Monetary and Fiscal Policies in Industrial Economies," in *International Aspects of Fiscal Policies*; and M. Feldstein, "Introduction," and S. Fischer, "International Macroeconomic Policy Coordination," both in *International Economic Cooperation*, M. Feldstein, ed. Chicago: University of Chicago Press, 1988.

have influenced the yen/dollar exchange rate. V. Vance Roley demonstrated that unanticipated changes in the U.S. money supply influenced the yen/dollar exchange rate but had little effect on domestic interest rates in Japan between 1977 and 1984. Ito and Roley discovered that most movements in the yen/dollar rate during 1980-5 occurred while the New York market was open and markets in Tokyo and Europe were closed. They concluded that only news about the U.S. money stock had a significant effect on daily changes in exchange rates.

In a sequel to that study, Ito investigated the timing of declines in the dollar relative to the yen between September 1985 and the end of 1986. He concluded that changes in market fundamentals, such as declining oil prices or changes in Japanese or American monetary policies, were responsible for the dollar's decline against the yen during that period. Sterilized government intervention had little effect on the exchange rate.

Jeffrey A. Frankel and Kenneth A. Froot have analyzed the role of expectations in determining the yen/dollar exchange rate. Surveys of bankers, corporate treasurers, currency traders, and economists throughout the early 1980s showed that respondents said they expected the dollar to decline against the yen, even as it continued to appreciate until February 1985. Frankel and Froot suggest that a "bandwagon effect" may have outweighed the respondents' longer-term expectations. They estimate that a 1 percent appreciation of the dollar during one week generated an expectation of a further 0.24 percent appreciation over the following week, but a depreciation of 0.34 percent over the following year.

Richard C. Marston has noted that productivity has been growing at a much higher rate in the Japanese manufacturing sector than in the United States. Since this productivity growth tends to be reflected in relative price changes, U.S. manufactured goods would have become increasingly uncompetitive if exchange rates had been constant. Marston concludes that to maintain competitiveness with Japan, the dollar may have to depreciate steadily against the real value of the yen.<sup>6</sup>

A grant from the Andrew Mellon Foundation has supported related Bureau research on what effect ex-

change rate fluctuations have on various sectors of the economy. Branson and James P. Love estimated that the dollar's appreciation, which ended in February 1985, resulted in substantial declines in employment and output in U.S. durable goods industries. They also found that appreciation of the yen led to significant declines in employment and output in Japanese machinery-producing industries.

However, Bonnie Loopesko and Robert A. Johnson found that the year's appreciation in 1985-6 led to smaller increases in export prices, smaller decreases in import prices, and less change in both exports and imports than occurred during previous real changes in the value of the yen. They suggest that during that period Japanese exporters may have squeezed profit margins in order to preserve market share, while Japanese importers may have failed to pass on to Japanese consumers the decline in the yen price of foreign products.<sup>7</sup>

### Competitiveness

In addition to exchange rates, such factors as the cost of labor and capital, investments in R and D, and trade barriers affect U.S. competitiveness with Japan. Melvyn A. Fuss and Leonard Waverman have estimated that U.S. automakers' costs were 34 percent higher than the costs of Japanese automakers in 1980, mostly because of excess capacity in the United States. Although the cost of labor was higher in the United States, the costs of capital and materials were lower. Fuss and Waverman conclude that Japan's competitive advantage in autos in 1980 came from more appropriate quality and size characteristics rather than from cost differences.

J. David Richardson found that from 1981-5 the effects of the high dollar and of increasing labor costs were offset by the effects of the Voluntary Restraint Agreement (VRA), which limited the number of Japanese autos imported by the United States. Because of the VRA, Japanese auto producers did not pass on the decline in their production cost to American consumers. Yen prices on autos sold in the United States rose much faster than other Japanese prices.

In a related study, Robert C. Feenstra estimated the value to American consumers of compact trucks, introduced by Japanese firms in the late 1970s. Feenstra estimated that the average consumer surplus per Japanese truck in 1979-80 was \$500-600. In later years, following the imposition of a 25 percent tariff, consumer surplus fell but U.S. tax revenues rose.

Barry J. Eichengreen has studied four U.S. industries that have been hurt by imports—autos, steel, apparel, and textiles. Production and net exports of steel

<sup>6</sup>T. Ito, "Capital Controls and Covered Interest Parity," NBER Reprint No. 897, August 1987; J. H. Makin and R. D. Sauer, "Exchange Rate Determination with Systematic and Unsystematic Policy Regime Changes: Evidence from the Yen-Dollar Rate," NBER Working Paper No. 1406, July 1984; V. V. Roley, "U.S. Monetary Policy Regimes and U.S.-Japan Financial Relations," NBER Reprint No. 866, May 1987; T. Ito and V. V. Roley, "News from the United States and Japan: Which Moves the Yen/Dollar Exchange Rate?" NBER Working Paper No. 1853, March 1986; T. Ito, "The Intradaily Exchange Rate Dynamics and Monetary Policies After the G-5 Agreement," NBER Reprint No. 954, January 1988; J. A. Frenkel and K. A. Froot, "Short-Term and Long-Term Expectations of the Yen/Dollar Exchange Rate: Evidence from Survey Data," NBER Working Paper No. 2216, April 1987; and R. C. Marston, "Real Exchange Rates and Productivity Growth in the United States and Japan," NBER Working Paper No. 1922, May 1986.

<sup>7</sup>W. H. Branson and J. P. Love, "The Real Exchange Rate, Employment, and Output in Manufacturing in the United States and Japan," NBER Working Paper No. 2491, January 1988; and B. Loopesko and R. A. Johnson, "Realignment of the Yen-Dollar Exchange Rate: Aspects of the Adjustment Process in Japan," in *Misalignment of Exchange Rates*.

have been declining in both the United States and Japan, although at a much faster rate in the United States. Decreased domestic demand and increased competition from developing countries have hurt steel industries in both countries. In autos, on the other hand, lower capital and labor costs and a high dollar until 1985 helped the Japanese to compete with U.S. producers, while trade barriers limited their share of the market. In textiles and apparel, as in steel, increased competition from developing countries has meant slow growth and even decline in both the United States and Japan.

Richard Baldwin and Krugman studied the development of 16K random access memory chips during 1978-83. Their analysis suggests that a protected domestic market gave Japanese firms a crucial advantage; without protection, those firms would have been uncompetitive both at home and abroad.<sup>8</sup>

Ryuzo Sato compared the effect of R and D spending by the United States and Japan on productivity and international competitiveness. He noted that about 60 percent of U.S. spending on R and D was in the defense and aerospace industries, while Japan spent about the same percentage on its chemical, electronics, communications, and automobile industries. Sato suggests that this difference may contribute to Japan's higher rate of growth in productivity and in market share of world exports.<sup>9</sup>

In contrast, Zvi Griliches and Jacques Mairesse found that a sample of Japanese and American manufacturing firms spent about the same percentage of their sales on R and D, and that the contribution of this spending to productivity growth was about the same in both countries. Griliches and Mairesse concluded that higher Japanese productivity growth cannot be attributed to differences in the level or effectiveness of R and D spending.

In a related study, M. Ishaq Nadiri and Ingmar R. Prucha found that growth in labor productivity in the electrical machinery industry between 1974 and 1979 was 3.5 percent in the United States and 8.9 percent in Japan. U.S. firms spent a higher percentage of their revenues on R and D, while Japanese firms invested more in physical capital. These and other studies comparing U.S.

and Japanese productivity growth are forthcoming in a Bureau book edited by Charles R. Hulten.<sup>10</sup>

Rachel McCulloch has studied recent developments in world trade in high technology products. She finds that the U.S. share of total world exports of these products has been rising during the 1980s; in 1984, it exceeded 25 percent, nearly reaching its 1960s level. However, the U.S. trade balance in high tech products has been worsening, as the U.S. share of world imports rose from 11 percent in 1970 to 23 percent in 1984. McCulloch notes that many of these imports come from foreign subsidiaries of U.S. multinationals. She also finds that Japan's share of world exports of high tech products rose from 7 percent in the mid-1960s to 20 percent by the mid-1980s, largely at the expense of European market share.<sup>11</sup>

Albert Ando and Alan J. Auerbach have investigated another possible competitive advantage that Japanese firms may have over American firms: a lower cost of capital. In two papers, Ando and Auerbach conclude that average capital costs may have been as much as 5.8 percentage points higher for a large group of nonfinancial U.S. corporations during 1967-83 than for similar Japanese firms. Differences in taxation do not explain this capital cost differential, because corporate taxes in general have been higher in Japan than in the United States. The capital cost difference most likely is the result of higher Japanese saving rates.

In a related study, Fumio Hayashi finds that Japanese corporate investment has responded primarily to stock prices, which reflect profit opportunities, and not to tax considerations. In two other papers, one of which was coauthored by Ito and Joel B. Slemrod, Hayashi examined the sources of differences between Japanese and American saving rates. The conclusion was that a strong bequest motive helps to explain that difference. Differences in measurement, higher housing prices, less generous mortgage financing, and tax rules that encourage saving appear to explain only a small portion of the higher rate of saving in Japan.<sup>12</sup>

<sup>8</sup>M. A. Fuss and L. Waverman, "Productivity Growth in the Automobile Industry, 1970-80: A Comparison of Canada, Japan, and the United States," NBER Working Paper No. 1735, October 1985, and "The Extent and Sources of Cost and Efficiency Differences between U.S. and Japanese Automobile Producers," NBER Working Paper No. 1849, March 1986; J. D. Richardson, "Exchange Rates and U.S. Auto Competitiveness," in *Misalignment of Exchange Rates*; R. C. Feenstra, "Gains from Trade in Differentiated Products: Japanese Compact Trucks," NBER Working Paper No. 1978, July 1986; B. J. Eichengreen, "International Competition in the Products of U.S. Basic Industries," in *The United States in the World Economy*, M. Feldstein, ed. Chicago: University of Chicago Press, 1988; and R. Baldwin and P. R. Krugman, "Market Access and International Competition: A Simulation Study of 16K Random Access Memories," NBER Working Paper No. 1936, June 1986.

<sup>9</sup>R. Sato, "R and D Activities and the Technology Game: A Dynamic Model of U.S.-Japan Competition," NBER Working Paper No. 1513, December 1984.

<sup>10</sup>Z. Griliches and J. Mairesse, "R and D and Productivity Growth: Comparing Japanese and U.S. Manufacturing Firms," NBER Working Paper No. 1778, December 1985; M. I. Nadiri and I. R. Prucha, "Comparison and Analysis of Productivity Growth and R and D Investment in the Electrical Machinery Industries of the United States and Japan," NBER Working Paper No. 1850, March 1986; and C. R. Hulten, ed., *Productivity Growth in Japan and the United States*. Chicago: University of Chicago Press, forthcoming.

<sup>11</sup>R. McCulloch, "United States-Japan Economic Relations," NBER Working Paper No. 2408, October 1987.

<sup>12</sup>A. Ando and A. J. Auerbach, "The Corporate Cost of Capital in Japan and the United States: A Comparison," NBER Working Paper No. 1762, November 1985, and "The Cost of Capital in the United States and Japan: A Comparison," NBER Working Paper No. 2286, June 1987; F. Hayashi, "Taxes and Corporate Investment in Japanese Manufacturing," NBER Working Paper No. 1753, November 1985, and "Why Is Japan's Saving Rate So Apparently High?" in NBER Macroeconomics Annual, Volume 1, 1986; and F. Hayashi, T. Ito, and J. B. Slemrod, "Housing Finance Imperfections and Private Saving: A Comparative Simulation Analysis of the United States and Japan," NBER Working Paper No. 2272, June 1987.

Sebastian Edwards and Robert E. Baldwin have studied international competition in Latin America and in the developing countries of Asia's Pacific Rim.<sup>13</sup> Edwards noted that U.S. exports to Latin America fell sharply following the onset of the debt crisis in 1982, but that the U.S. share of Latin imports remained steady between 1970 and 1985. However, there has been a shift away from U.S. sales of machinery and transport equipment and an increase in sales of chemicals, foodstuffs, and live animals during that period. The United States has not lost manufacturing share to Japan, but rather to Korea, Taiwan, and to Latin American countries. During the same period, Japan's share of Latin American imports remained relatively constant at only a small fraction of the U.S. share. Baldwin found that, in the rapidly growing countries of East Asia, exports from both the United States and Japan have increased dramatically over the past two decades. Japan's share of imports of those countries is higher than the U.S. share, but Japan's relative advantage has not been rising over time.

## Labor Markets

Several NBER researchers have noted the flexibility of the Japanese labor market and its importance for Japan's response to economic shocks. Robert J. Gordon has found that wages and prices were considerably more sensitive to fluctuations in output in Japan than in the United States since World War II, although both countries had flexible wages before 1940. Because of Japan's more flexible wages, an increase in inflation leads to a smaller increase in output in Japan than in the United States or Europe, Gordon finds.

Herschel I. Grossman and William Haraf have suggested that the annual national wage-setting—the Shunto—conducted each spring in Japan contributes to Japanese wage flexibility. Martin Weitzman, alone and in a joint paper with Richard B. Freeman, confirmed that flexible wages were a key element in Japan's successful response to the oil shocks of the 1970s. When oil prices rose dramatically in 1973 and 1979 and Japanese profits fell, the bonuses received by Japanese workers also fell. However, most of the adjustment in labor costs came through declines in wage rates.

According to Stanley Fischer, this flexibility allowed Japan to avoid much of the stagflation that plagued other developed countries following the two oil shocks. Greater wage flexibility, rather than differences in monetary policy, explains Japan's relative success from

1973–86 as compared to Germany, the United Kingdom, and the United States.<sup>14</sup>

NBER researchers also have considered other aspects of labor markets in Japan. In a series of papers Tadashi and Tetsuji Yamada have studied the labor supply and fertility decisions of Japanese women, especially the decision to work part time or full time. In a separate paper, the Yamadas find that the impact of Japanese Social Security benefits on retirement is much greater for full-time workers than for part-time workers. They also estimate that labor market conditions strongly affect the probability of retirement.<sup>15</sup>

Jacob A. Mincer and Yoshio Higuchi find that Japanese manufacturing workers have much lower turnover rates than American workers, primarily because they receive more on-the-job training and wages that rise faster with seniority than wages in the United States do.<sup>16</sup> They also find that turnover rates and wage growth for workers in Japanese-owned plants in the United States are closer to rates in Japan than to rates of U.S.-owned plants in the United States.

## Ongoing Research

The NBER is continuing to study many aspects of the Japanese economy. Ando, Auerbach, and Hayashi are extending their work on Japanese saving rates, investment, and the cost of capital. Robert Gordon has just helped to organize a conference on U.S. and Japanese saving, investment, capital flows, and exchange rates sponsored in part by the Japanese Ministry of Finance (MOF) and the Foundation for Advanced In-

<sup>14</sup>R. J. Gordon, "Wages and Prices Are Not Always Sticky: A Century of Evidence for the United States, the United Kingdom, and Japan," NBER Reprint No. 372, May 1983, and "Productivity, Wages, and Prices Inside and Outside of Manufacturing in the United States, Japan, and Europe," NBER Reprint No. 970, January 1988; H. I. Grossman and W. S. Haraf, "Shunto, Rational Expectations, and Output Growth in Japan," NBER Working Paper No. 1144, June 1983; M. Weitzman, "Macroeconomic Implications of Profit Saving," in NBER Macroeconomics Annual, Volume 1, 1986; R. B. Freeman and M. Weitzman, "Bonuses and Employment in Japan," NBER Working Paper No. 1878, April 1986; and S. Fischer, "Monetary Policy and Performance in the United States, Japan, and Europe, 1973–86," NBER Working Paper No. 2475, December 1987.

<sup>15</sup>T. and T. Yamada, "Estimation of a Simultaneous Model of Married Women's Labor Force Participation and Fertility in Urban Japan," NBER Working Paper No. 1362, June 1984, "Part-Time Employment of Married Women and Fertility in Urban Japan," NBER Working Paper No. 1474, September 1984, "Part-Time Work of Married Women in Japan," NBER Working Paper No. 1608, April 1985, and "Social Security and Earlier Retirement in Japan: Cross-Sectional Evidence," NBER Working Paper No. 2442, November 1987; and T. and T. Yamada, and F. Chaloupka, "A Multinomial Logistic Approach to the Labor Force Behavior of Japanese Married Women," NBER Working Paper No. 1783, December 1984.

<sup>16</sup>J. A. Mincer and Y. Higuchi, "Wage Structures and Labor Turnover in the United States and Japan," NBER Working Paper No. 2306, July 1987.

<sup>13</sup>S. Edwards, "The United States and Foreign Competition in Latin America," and R. E. Baldwin, "U.S. and Foreign Competition in the Developing Countries of the Asian Pacific Rim," both in *The United States in the World Economy*.

formation and Research (FAIR).<sup>17</sup> Krugman is organizing a project on U.S. and Japanese trade and investment in the 1990s.

The NBER also holds regular meetings and workshops designed to bring together Japanese and American economists. For the past two years, the MOF and the FAIR have jointly sponsored a session at the NBER Summer Institute on U.S.-Japanese economic relations, which I have organized. MOF and the Bureau also have held a joint conference in Tokyo in the fall of the past several years on exchange rates, government finance, and financial markets. Ito, in collaboration with the Tokyo Center for Economic Research, has organized an annual conference in Tokyo on a variety of topics. This year's conference focused on saving. Next year's conference will compare labor relations and corporate management in the United States and Japan.<sup>18</sup>

NBER's current research on Japan is being supported by grants from the Ford Foundation, Mitsubishi Trust Bank, the National Institute for Research Advancement, Japan (NIRA), the Nippon Telegraph and Telephone Corporation, and the Pew Charitable Trusts.

<sup>17</sup> These papers will appear in a special issue of the *European Economic Review*.

<sup>18</sup> Papers from these conferences will be published in special issues of the *Journal of the Japanese and International Economies*.

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## Research Summaries

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### Understanding Over- and Underemployment

Kevin Lang

While most models of labor supply assume that workers are free to choose their hours of work, in reality, the hours of work of many jobs are fixed by the employer. Often employees must work together as a team; therefore, all must be present at the same time, and the firm rather than individual workers must choose work hours. Evidence from the Panel Study of Income Dynamics confirms that such constraints are widespread; among prime-age male wage earners in private nonagricultural employment, only 15 percent are free to vary their hours in either direction; 43 percent can neither reduce nor

increase their hours; 15 percent can work more but not less; and 27 percent can work less but not more.<sup>1</sup>

The fact that workers are not entirely free to choose their hours need not imply that they are dissatisfied with the number of hours that they work. Instead, it is possible that some firms set the workweek at 35 hours and employ workers who want a 35-hour workweek while other firms with 40-hour workweeks employ workers who want 40-hour weeks, and so on. Indeed, there is evidence that this type of matching takes place. Of the 85 percent of workers who cannot vary their hours freely, only about half would like to work a different number of hours. Still, this means that over 40 percent of the wage earners are dissatisfied with their hours. Of that group, almost all would like to work more hours. I shall refer to workers who want to work more hours at their usual wage as "underemployed" and those who want to work fewer hours as "overemployed."

Hours constraints are somewhat more prevalent among wage earners than among other workers. Nevertheless, dissatisfaction with work hours is widespread in the United States. Over one-third of workers would like to work a different number of hours from what they presently work at the same rate of pay. Of these, about three-quarters would like to work more, and one-quarter would like to work less.<sup>2</sup> In Canada, such constraints seem to be even more pervasive: about half of prime-age Canadian workers want a different number of hours. Those who want more hours outnumber those who want fewer hours by more than two to one.

The fact that various surveys using very different samples and questions all find perceived constraints on hours to be widespread, and that the vast majority of constrained workers prefer more rather than fewer hours, suggests that these phenomena are real and not merely the product of a particular set of questions. Indeed, the Canadian survey makes the greatest attempt to ensure that respondents understand the questions, and it finds the largest proportion of workers dissatisfied with the number of hours they work.

Combining the results from diverse surveys, a reasonable estimate is that three out of ten U.S. and Canadian workers are underemployed while somewhat more than one in ten are overemployed. The Canadian data are even more specific, since the Canadian survey asked how much more or less each individual would like to work. It appears that the average Canadian worker would like to work an additional three to four hours per week.

<sup>1</sup> This article is based on research I have been conducting jointly with Shulamit Kahn. The results are contained in our working papers, "Constraints on the Choice of Work Hours: Agency versus Specific Capital," NBER Working Paper No. 2238, May 1987, "The Effects of Hours Constraints on Labor Supply Estimates," forthcoming as an NBER Working Paper, and a paper in progress on hours constraints in Canada.

<sup>2</sup> S. E. Shank, "Preferred Hours of Work and Corresponding Earnings," *Monthly Labor Review* 109 (November 1986), pp. 40-44.



At first blush these figures suggest a significant economic problem. However, without understanding why underemployment (or overemployment) occurs, we cannot tell whether constraints on hours are inefficient and whether they are truly involuntary or simply reflect workers' desires to renege on an arrangement into which they entered voluntarily.

Economists have developed three models to explain hours constraints: 1) models of long-term employment relationships in which workers may be paid more or less than they are worth (that is, wage does not equal the value of marginal product) at any particular time even though, on average, workers receive the value of their marginal contribution to output over the entire relationship; 2) models in which setup costs and worker fatigue combine to produce an optimal number of daily or weekly hours; and 3) implicit contract models in which firms "insure" workers against fluctuations in demand.

In a pair of highly influential articles, Edward P. Lazear pointed out that when workers and firms have long-term employment relationships, profit-maximizing firms may pay workers more than the value of their marginal products at some points, provided that they pay them less than their value of marginal product at other times.<sup>3</sup> In periods when workers earn "too much," firms will restrict workers' hours; in periods when workers earn "too little," firms will force them to work more than they wish.

The extreme case is mandatory retirement in which workers are restricted to working zero hours. Lazear argues that firms tend to "overpay" senior workers as a "carrot" to induce all employees, including junior employees, to work hard. Because they are "overpaid," senior members will want to remain with the firm even after they would wish to retire if they were paid only the value of their marginal product. Consequently, retirement is mandatory.

The fact that workers are dissatisfied does not imply that there is a role for government regulation of mandatory retirement and hours constraints. Lazear maintains that the earnings/hours profiles offered by firms will be efficient so that they cannot be improved by outside intervention. Although workers would like to renege on their implicit agreement with the firm, the "contract" was entered into voluntarily. In fact, Lazear's argument for efficiency has a technical error,<sup>4</sup> so that there may be ways to improve the functioning of

the labor market. However, the basic argument—that if workers and firms voluntarily agree on hours constraints, outside parties cannot improve the "contract" by changing those hours—is correct within the framework of the model.

The primary prediction of the Lazear model—that senior workers will tend to want to work more and junior workers will tend to want to work less—is refuted by the data. Not only does the number of workers who want to work more exceed the number who want to work less at virtually all levels of seniority, but wanting to work more declines rather than rises with seniority while wanting to work less rises. These findings cast strong doubt on Lazear's defense of mandatory retirement and hours constraints as the efficient outcome of long-term contracting in which workers and firms agree to deferred payment schedules.

The fact that wanting to work less rises and wanting to work more declines with seniority is consistent with a long-term employment relationship in which firms "overpay" workers during their training period and later recoup their investment. However, the fact that at no seniority level do most workers prefer less work demonstrates that long-term employment relationships cannot be the only significant cause of hours constraints.

The second primary explanation for hours constraints is that workers' productivity declines with fatigue. Therefore, firms do not want their employees to work too many hours. At the same time, since there are setup costs (including certain fringe benefits that do not depend on hours of work), firms do not want employees to work too few hours. Depending on how fatigue varies with hours and on the importance of setup costs, there will be an optimal number of hours for each job. The optimal number of hours will be chosen so that the additional daily wage the firm must pay for another daily hour of work (the value the worker puts on an additional hour) just equals the worker's output from that hour. On the other hand, workers' average hourly wages will equal their average hourly product. Therefore, if as we expect, workers' average productivity over the day exceeds their productivity in their last hour of the day, then their wage will exceed the value that they put on an additional hour of leisure. Thus they will want to work more at their usual wage, provided of course that fatigue does not increase the disutility of working too much.<sup>5</sup>

As in Lazear's model, hours constraints arise from the free contracting of workers and firms. Although workers would like to renege on the deal, they cannot be made better off by restrictions on their freedom to enter into such "agreements." The overtime provisions

<sup>3</sup>E. P. Lazear, "Agency, Earnings Profiles, Productivity, and Hours Restrictions," *American Economic Review* 71 (September 1981), pp. 606-620, and "Why Is There Mandatory Retirement?" *Journal of Political Economy* 87 (December 1979), pp. 1261-1284.

<sup>4</sup>Lazear assumes that hours are set so that the value of marginal product equals the shadow value of leisure. However, since the number of hours affects the size of the bond, the optimal choice of hours takes into account the impact of changing hours on the cost of the bond. See K. Lang, "Why Was There Mandatory Retirement? Or, the Impossibility of Efficient Bonding Contracts," *NBER Working Paper* No. 2199, March 1987.

<sup>5</sup>This type of model is discussed in greater detail in S. Rosen, "The Theory of Equalizing Differences," in *Handbook of Labor Economics*, Volume 1, O. C. Ashenfelter and R. Layard, eds. Amsterdam: North Holland, 1986.



of minimum wage laws provide a test of the fatigue model. The prevalence of workweeks that last exactly 40 hours suggests that the overtime provisions of minimum wage laws, which typically require time-and-a-half for more than 40 hours of work, have real effects. While, in principle, workers and firms should be able to reach agreements that eliminate the effects of such laws, the evidence suggests that these agreements do not completely "unravel" the overtime provisions. If the fatigue hypothesis were correct, we would expect workers who work exactly 40 hours per week (the point at which the overtime provisions become effective) to be particularly inclined to work more hours at their usual rate. To understand this, note that, according to this hypothesis, if firms could hire workers for additional hours at the straight-time wage, they would choose to do so. At the number of hours chosen at the straight-time wage, workers on average would be underemployed. Since they are restricted to 40 hours, workers employed at exactly 40 hours per week have an even greater tendency to be underemployed. In fact, if anything, the data seem to suggest the opposite: workers who work 40 hours per week are less likely than other workers to want to work more hours.

The final explanation for hours constraints is that firms insure workers against demand fluctuations. Wages (and sometimes salaries) are constant but hours fluctuate to accommodate variations in demand.<sup>6</sup> In high-demand periods, workers will want to work less, while in low-demand periods, they will want to work more. Again, because the constraints reflect the outcome of free contracting between workers and firms, workers and firms may wish to renege on the contract, but limiting their ability to contract freely cannot make them better off.

Since the factors that cause underemployment in the implicit contract (insurance) model are the same as those that cause unemployment, we would expect individuals who have experienced unemployment to be more likely to experience underemployment and that underemployment would be most prevalent when unemployment is high. While workers who have experienced recent unemployment are more likely to indicate that they are underemployed, the relationship between underemployment and the unemployment rate is weak. Moreover, workers who have experienced a recent reduction in hours do not appear to be more likely to be underemployed.

In sum, none of the models of hours constraints appears to provide an adequate explanation for the empirical regularities. The only explanation that appears broadly consistent with the data is the fatigue model, if firms and workers are able to avoid the impact of the overtime provisions of minimum wage laws entirely.

However, it is hard to reconcile the absence of an impact of overtime provisions with the preponderance of jobs with 40-hour weeks.<sup>7</sup> Moreover, other studies suggest that firms and workers are not able to circumvent these laws entirely.

While we lack an adequate explanation for hours constraints, we have begun to develop an understanding of the factors that are associated with underemployment. It appears that at least among men, the same factors that generally are associated with low wages also are correlated with underemployment. Underemployment declines with seniority, experience, and education, and is higher for blacks than for whites.

This suggests that as wages increase, desired hours of work decline more rapidly than actual hours. In fact, holding other factors constant, underemployment declines as wages rise. In other words, it appears that because of hours constraints, estimates of labor supply elasticity are biased upward. This is somewhat surprising since we might have expected that if workers were not free to vary their hours, we would underestimate labor supply elasticities. On the other hand, to the extent that workers with different wages must work the same hours, we expect hours to be relatively unresponsive to wage differences. An extreme example helps to clarify this point—if every job required a high-skill worker and a low-skill worker, and high- and low-skill workers had to be present for the same hours, the distribution of hours among the high- and low-skill workers would be identical even if low-skill workers preferred to work more hours. It appears that for men, typical labor supply elasticities may be overestimated by about 0.1. This means that for a full-time worker, a 10 percent wage increase would increase desired hours by about .04 hours less than standard estimates of labor supply suggest.

Another way of phrasing the same result is that distribution of hours in the economy reflects the tastes of more rather than fewer skilled workers. When combined with a tendency for workers in an establishment to have to work similar hours, the regularities of hours constraints can be "explained" by any model that accounts for the greater responsiveness of the market to the desires of more skilled workers.

Such models are not hard to develop. For example, it is plausible that more skilled workers require greater compensation for departing from their desired hours, so that it is more costly to have skilled workers who are not at their preferred level of hours. However, such models have not been subject to testing.

In sum, there is strong evidence that many workers are dissatisfied with their hours and that, in particular, a substantial fraction of workers would like to work

<sup>6</sup>This model was developed to explain unemployment. For a review, see D. M. Lillian and R. E. Hall, "Cyclical Fluctuations in the Labor Market," in *Handbook of Labor Economics, Volume 1, 1986*.

<sup>7</sup>See also S. J. Trejo, "Economic Effects of the Overtime Provisions of the Fair Labor Standards Act," *University of California at Santa Barbara, unpublished, 1986*.

more. Unfortunately, at this stage, we lack sufficient understanding of the reasons for hours constraints to determine the appropriate policy response, if any. At the same time, the economic theories that have been developed to explain hours constraints and that suggest that such hours constraints do not require policy intervention have not been supported empirically.

## Nominal Price Rigidity

David Romer

Most economists agree that monetary policy has a large impact on the economy. For example, the Federal Reserve's decision to tighten monetary policy in the early 1980s to combat inflation is viewed widely as the major cause of the 1982 recession. More generally, changes in aggregate demand appear to play a central role in short-run movements in output and unemployment.

One of the central issues in macroeconomics is why movements in aggregate demand have such large effects. If prices and wages were perfectly flexible, then they would adjust immediately to changes in aggregate demand—moving proportionately with the money supply if monetary policy changed, for example—and demand fluctuations would affect inflation but not output. The stickiness of nominal wages and prices is deeply puzzling. There are few barriers to nominal flexibility. Firms could reduce nominal rigidity substantially, easily, and inexpensively by indexing wages more, by adjusting wages more frequently during contracts, by indexing prices, or by changing prices more often. How then can nominal rigidities, with the power to plunge the economy into a recession, arise?

Much of my work over the past few years, undertaken jointly with Laurence Ball, has been devoted to this subject. Here I describe briefly some of this work, as well as some of the work on which our research is based.

### Small Frictions In Price-Setting and Large Nominal Rigidities

The central idea underlying recent "new Keynesian" work on nominal rigidities is that price stickiness of all firms can have large effects on the economy as a whole, even though the costs to each firm of keeping its own price rigid are small.

A change in the price that a firm charges has a cost and benefit to the firm. For example, a price increase decreases sales but increases revenues from the sales

that remain. The firm sets its price so that the cost and benefit of a price change are in balance. At the margin, the firm is indifferent about whether to change its price. Thus, the firm is relatively unconcerned about whether to change its price in response to a small change in aggregate demand. Technically, the costs to the firm of keeping its price fixed are "second order" in the size of the shock.

However, the effects of unchanged prices of all firms are large. If prices remain fixed, changes in aggregate demand are translated directly into changes in output: that is, aggregate demand movements have "first order" effects on output. Because firms with market power produce inefficiently low levels of output, increases in aggregate output raise welfare and decreases in output reduce welfare. In sum, a firm suffers only second order costs from keeping its price fixed, but price stickiness by all firms leads to first order fluctuations in output and in welfare.<sup>1</sup>

The fact that the costs to a firm of keeping its price fixed in the face of movements in aggregate demand are second order does not establish that those costs are small for fluctuations of realistic size. Suppose that labor supply is relatively inelastic, so that workers do not wish to vary much the amount that they work in response to moderate changes in real wages. Then in the face of a realistic movement in aggregate demand—a fall of a few percentage points, for example—and sticky prices, firms have tremendous incentives to adjust their prices. Intuitively, if wages are flexible, then real wages must fall greatly when hours of work fall, because of inelastic labor supply. When wages are low, the cost to the firm of producing additional output is low; therefore, the firm's incentives to cut prices and expand output are large. If wages are rigid, workers who are unable to find work (or as much work as they desire) have a strong incentive to bid wages down. In short, the costs of price stickiness, although second order, are very large for moderate fluctuations in aggregate output.

The firm's costs of keeping its price fixed are large because its desired price fluctuates greatly in response to movements in aggregate output. To generate small costs of nominal price rigidity, there needs to be some force that causes firms to wish to vary their prices only moderately in the face of output variations. When it considers changing its nominal price in response to a movement in aggregate demand with other firms' prices unchanged, a firm is considering changing its relative price in response to a movement in aggregate real output. Ball and I have shown that, in general, a smaller re-

<sup>1</sup>N. G. Mankiw, "Small Menu Costs and Large Business Cycles: A Macroeconomic Model of Monopoly," *Quarterly Journal of Economics* 100 (May 1985), pp. 529-539; and G. A. Akerlof and J. Yellen, "A Near Rational Model of the Business Cycle, with Wage and Price Inertia," *Quarterly Journal of Economics* 100 (Supplement, 1985), pp. 823-838.

sponsiveness of desired real prices to movements in real output—that is, greater *real* rigidity of prices—reduces the costs to a firm of keeping its nominal price fixed in response to aggregate demand movements.<sup>2</sup>

As a specific example of a real rigidity that could lead to this result, suppose that there is some benefit to firms of paying high wages. That is, suppose that firms pay efficiency wages and therefore that workers are off their labor supply curves. Suppose also that the optimal real wage for firms to pay does not vary greatly with aggregate output. Then, the real wage would not fall greatly in a recession, and firms' incentives to cut prices and expand output would be small. Indeed, if the real wage is only slightly cyclical, then firms' incentives to change prices can be exceedingly small.

If the cost to firms of keeping their prices fixed is small, only a small barrier to price adjustment is needed to generate price stickiness: prices can be sticky even though the costs of greatly increasing price flexibility are small. The particular form of the friction in price adjustment is not important: it could be a physical cost of changing prices; a small amount of workers' or customers' "money illusion"; or a small amount of convenience to managers of setting their prices and thinking about them in nominal rather than real terms. Real price rigidity is essential to making the costs of nominal rigidity small. Because full adjustment to a nominal shock requires no changes in real wages or relative prices, real rigidity *alone* does not generate nominal rigidity. Thus, neither large real rigidities nor small nominal frictions by themselves generate substantial nominal rigidity, but together they do.

### Externalities from Price Rigidity

When microeconomists call for government intervention in the economy, they are expected to justify their recommendations by a demonstration of some type of market failure. In the absence of market failure, the unregulated outcome is efficient and no intervention is needed. Macroeconomists traditionally have been held to a lower standard: Keynesians long have called for the government to attempt to stabilize aggregate demand without an analysis of any market failure that would justify this intervention.

Movements in aggregate demand affect real output because prices are sticky. Thus the question of whether the government should intervene in the economy by stabilizing aggregate demand is equivalent to the question of whether there are externalities from price stickiness. In the absence of any externalities, the social costs of stickiness equal the private costs, and so individual firms have the proper incentives to change their prices, and the socially optimal amount of aggregate

instability will result. Moreover, since the cost of making one's prices flexible is small, in order for the benefits of stabilization policies to be large, private costs of stickiness must be small and the social costs large: there must be not just externalities, but large externalities, from stickiness.

Ball and I have reached three conclusions about externalities from price rigidity.<sup>3</sup> First, in general, there are externalities from rigidity; an unregulated economy will not arrive at the optimal outcome. The externality is intuitive: by keeping its price rigid, a firm contributes to aggregate price stickiness and thus causes nominal shocks to have larger real effects. This increased instability harms everyone.

Second, under simple conditions, the externalities from rigidity are small. When aggregate demand is unexpectedly low, price stickiness causes output to fall and thus harms all firms. However, when demand is unexpectedly high, price stickiness causes output to rise and thus helps all firms. Rational expectations imply that demand on average is neither unexpectedly low nor unexpectedly high. Thus the social costs of stickiness, like the private costs, are second order. As a result, when we compute externalities from rigidity, assuming that labor supply is relatively inelastic and that workers are not off their labor demand curves, we find that the externalities are small.

Third, it is possible for the externalities to be large. Most importantly, increases in real rigidity increase the size of the externalities. A higher degree of real rigidity means that firms wish to change their prices less in response to aggregate output movements but does not imply that firms dislike fluctuations in aggregate output any less. That is, increased real rigidity lowers the cost to an individual firm of having its price rigid while leaving unchanged the cost of *all* prices being rigid. Thus when there are large real rigidities, there can be large externalities from stickiness and large benefits from aggregate demand stabilization.

### Empirical Evidence

If this new class of theories of the source of price stickiness and cyclical fluctuations is to prove persuasive ultimately, it must be tested against competing theories and found to describe economic behavior better. At the microeconomic level, price stickiness is evident: many prices remain unchanged for years. The crucial question is whether this microeconomic rigidity has important macroeconomic effects.

Theories of aggregate nominal stickiness arising from frictions in price-setting—"new Keynesian" theories—result in predictions that differ from those of both the new classical alternative (Lucas's "imperfect information" theory) and of traditional Keynesian theories

<sup>2</sup>L. Ball and D. Romer, "Real Rigidities and the Nonneutrality of Money," NBER Working Paper No. 2476, December 1987.

<sup>3</sup>L. Ball and D. Romer, "Are Prices Too Sticky?" NBER Working Paper No. 2171, February 1987.

of the real effects of nominal shocks. Because price stickiness arises endogenously in new Keynesian theories, they predict the degree of aggregate price rigidity. Most importantly, they predict that increases in mean inflation, by causing firms to adjust their prices more often, cause demand shocks to be passed more rapidly into prices. That is, they predict that higher trend inflation reduces price stickiness. This prediction is not made by other theories. Traditional Keynesian theories simply assume price stickiness and thus make no predictions about its determinants. Lucas's theory predicts that the real effects of demand movements are determined by the relative magnitudes of aggregate and firm-specific shocks and that anticipated factors—such as trend inflation—are irrelevant.

Ball, N. Gregory Mankiw, and I have tested this prediction about the impact of average inflation on price rigidity.<sup>4</sup> We estimate the real effects of demand disturbances for a large number of countries. We then regress these estimates on mean inflation (and on the variance of aggregate demand movements). We find that mean inflation has a large and statistically significant impact on the real effects of demand movements: prices are more flexible in economies with high inflation. Examining the change in price flexibility within countries over time confirms this result: we find that the change in average inflation from the first part of our sample period to the second has a large and significant effect on the change in the estimated real effect of a demand shock.

<sup>4</sup>L. Ball, N. G. Mankiw, and D. Romer, "The New Keynesian Economics and the Output-Inflation Trade-Off," *Brookings Papers on Economic Activity*, forthcoming.

## Economic Outlook Survey

### Second Quarter 1988

Victor Zarnowitz

According to the June survey of 19 professional forecasters taken by the NBER and the American Statistical Association, the economy's recent performance was much better than had been anticipated in the wake of the October 1987 stock market crash. The depressing effects of that debacle were countered effectively, first by the Fed's timely shift to a moderately stimulative policy and then by falling interest rates, rising inventory

investment, and especially rapidly expanding export demand. Since the widespread predictions of a slow-down early this year were refuted by the events, most economists began revising their forecasts upward. The median forecast shows real GNP gaining 3.4 percent in 1987-8. The growth rates projected for next year are lower but sufficient to keep the unemployment rate near 5.5 percent. However, most respondents also foresee rises in inflation and interest rates.

### Growth Prospects Raised This Year but Moderation Ahead

The median predictions of real GNP growth are 2.7 percent, 2.5 percent, 3.3 percent, 2.7 percent, and 1.9 percent for the five successive quarters 1988:2-1989:2 (all at annual rates). Output is expected to increase 2.6 percent between 1988:2 and 1989:2 and 2.3 percent between 1988 and 1989. These forecasts imply an orderly transition from the above-potential growth rates of 1987:3-1988:1 (averaging about 4.2 percent) to a more moderate pace of expansion. This year's growth record now is expected to be good rather than substandard. However, the forecasts for 1989 remain unchanged on average and are significantly lower than for 1988.

All but one of the respondents predict higher growth rates for 1987-8 than for 1988-9: one predicts a recession next year. The standard deviations of the individual quarterly predictions have a range of 1.2-1.6 percent. In the March survey the dispersion was much larger: 2-3 percent. Thus it appears that the forecasters have become more certain as well as more optimistic.

### Probabilities of Growth and Recession

The following percentage distributions show the probabilities that forecasters attach to different outcomes for growth. The shift from lower to higher categories is very conspicuous in the tabulation for 1987-8.

	1987-8 (March 1988 survey)	1987-8 (June 1988 survey)	1988-9 (March 1988 survey)	1988-9 (June 1988 survey)
Chances in 100 of Real GNP Growing by				
4 percent or more	5	12	8	12
2.0-3.9 percent	52	71	55	47
0-1.9 percent	33	13	25	26
Less (negative)	10	3	13	14

The individual assessments of the probability that real GNP will decline yield much lower distribution statistics now than in the March survey:

	Mean (March 1988)	Mean (June 1988)
1988:2	32	9
1988:3	23	14
1988:4	23	18
1989:1	26	25
1989:2	n.a.	29

## Projections of GNP and Other Economic Indicators, 1988-9

	Annual						Percent Change	
	1987	1988	1989			1987	1988	
	Actual	Forecast	Forecast	to	to	1988	1989	
1. Gross National Product (\$ billions)	4488.5	4767.4	5067.6	6.2	6.3			
2. GNP Implicit Price Deflator (1982 = 100)	117.6	121.1	126.0	3.0	4.1			
3. GNP in Constant Dollars (billions of 1982 dollars)	3821.0	3949.0	4040.5	3.3	2.3			
4. Unemployment Rate (percent)	6.2	5.6	5.6	-0.6 <sup>1</sup>	0.0 <sup>1</sup>			
5. Corporate Profits After Taxes (\$ billions)	137.8	149.7	155.5	8.6	3.9			
6. Nonresidential Fixed Investment (billions of 1982 dollars)	448.3	494.6	511.0	10.3	3.3			
7. New Private Housing Units Started (annual rate, millions)	1.62	1.50	1.50	-7.46 <sup>2</sup>	0.00 <sup>2</sup>			
8. Change in Business Inventories (billions of 1982 dollars)	42.9	36.0	24.8	-6.9 <sup>3</sup>	-11.2 <sup>3</sup>			
9. Treasury Bill Rate (3-month, percent)	5.83	6.20	6.62	0.37 <sup>1</sup>	0.42 <sup>1</sup>			
10. Consumer Price Index (annual rate)	3.6	4.0	4.8	0.4 <sup>1</sup>	0.8 <sup>1</sup>			

	Quarterly						Percent Change	
	1988	1988	1988	1989				
	Q1	Q2	Q3	Q4	Q1	Q2	Q1 88 to	Q2 88 to
	Actual	Forecast					Q1 89	Q2 89
1. Gross National Product (\$ billions)	4660.9	4734.9	4803.3	4881.1	4958.6	5031.0	6.4	6.3
2. GNP Implicit Price Deflator (1982 = 100)	119.4	120.4	121.6	122.9	124.1	125.2	3.9	3.9
3. GNP in Constant Dollars (billions of 1982 dollars)	3902.6	3929.0	3954.0	3987.0	4013.6	4033.0	2.8	2.6
4. Unemployment Rate (percent)	5.7	5.5	5.5	5.5	5.5	5.5	-0.2 <sup>1</sup>	0.0 <sup>1</sup>
5. Corporate Profits After Taxes (\$ billions)	147.2	148.0	150.0	154.0	155.2	155.0	5.4	4.7
6. Nonresidential Fixed Investment (billions of 1982 dollars)	488.3	491.5	496.2	501.6	508.4	512.5	4.1	4.3
7. New Private Housing Units Started (annual rate, millions)	1.48	1.52	1.52	1.50	1.46	1.48	-1.35 <sup>2</sup>	-2.63 <sup>2</sup>
8. Change in Business Inventories (billions of 1982 dollars)	57.9	40.0	28.0	20.0	29.0	28.1	-28.9 <sup>3</sup>	-11.9 <sup>3</sup>
9. Treasury Bill Rate (3-month, percent)	5.76	6.15	6.40	6.60	6.63	6.63	0.87 <sup>1</sup>	0.48 <sup>1</sup>
10. Consumer Price Index (annual rate)	2.4	4.1	4.3	4.6	4.6	4.7	2.2 <sup>1</sup>	0.5 <sup>1</sup>

SOURCE: The National Bureau of Economic Research and American Statistical Association, Business Outlook Survey, June 1988. The figures on each line are medians of nineteen individual forecasts.

<sup>1</sup>Change in rate, in percentage points.

<sup>2</sup>Possible discrepancies in percentage changes are caused by rounding.

<sup>3</sup>Change in billions of dollars.

Note the reversal in the pattern of these figures: the June probabilities increase for the more distant future, whereas the March probabilities decrease. The corresponding standard deviations are much lower in the current than in the previous survey (10-20 versus 23-28).

### Most Unemployment Forecasts Lower and Steadier

The quarterly predictions of the civilian unemployment rate cluster around 5.5 percent, much lower than the 6 percent level prevailing in the March survey. The range for 1989:2 is 4.9-6.3 percent; the mean  $\pm$  1 standard deviation is 5.6 percent  $\pm$  0.4 percent. Ten individuals expect the unemployment rate to be higher a year

from now, seven predict that it will be lower, and two forecast that it will be unchanged. The averages for both 1988 and 1989 are 5.6 percent.

### No Inflation Alarm but Higher Rates Expected

The GNP implicit price deflator (IPD) is expected to rise 3 percent in 1987-8, 4 percent in 1988:2-1989:2, and 4.1 percent in 1988-9. The figures for the five quarters 1988:2-1989:2 are 3.5 percent, 3.7 percent, 4.4 percent, 3.9 percent, and 3.5 percent. The predicted inflation rates vary considerably across individuals as well as over time. Twelve respondents expect inflation to be

higher in 1989:2 than in 1988:2, but six expect it to be lower.

The probabilistic forecasts actually show a slight shift toward lower IPD inflation when compared with the March survey:

	1987-8 (March 1988 survey)	1987-8 (June 1988 survey)	1988-9 (March 1988 survey)	1988-9 (June 1988 survey)
Chances in 100 of IPD Increasing by				
6 percent or more	5	5	11	12
4.0-5.9 percent	26	15	41	36
2.0-3.9 percent	62	72	41	42
Less than 2 percent	6	9	8	9

The group projects higher inflation rates for the consumer price index (CPI), rising from 4.1 percent in 1988:2 to 4.7 percent in 1989:2. The annual averages are 4.0 percent for 1988 and 4.8 percent for 1989 (in 1987 the CPI rose 3.6 percent). The individual predictions for 1989:2 and 1989 include outliers that are far apart (ranges of 3.6-6.9 percent) but their standard deviations are not very large (about 0.8 percent).

### Gradual Increases in Interest Rates

The three-month Treasury bill rate is predicted to rise slowly from 6.2 percent to 6.6 percent between 1988:2 and 1989:2. The annual averages for 1988 and 1989 are very similar. Most individual predictions fall in the 6-7 percent interval; the standard deviations vary just between 0.6 percent and 0.8 percent. The consensus that interest rates are heading upward has strengthened greatly in the last few months, but there are always some individual outliers. The range for 1989:2 is 5.8-10.0 percent, for example.

The yield on new high-grade corporate bonds is expected to increase from 9.6 percent in 1988:2 to 10.2 percent in 1989:2. The range for 1989:2 is 9.5-13.5 percent.

### Large Gains This Year in Exports and Business Investment

Net exports of goods and services in billions of 1982 dollars are predicted to be -117 in 1988:2 and -89 in 1989:2, a reduction of 24 percent in this measure of the trade deficit. The median forecasts for 1988 and 1989 suggest a narrowing of the negative trade imbalance by 20 percent. These figures are slightly smaller than their counterparts in the March survey.

The gain in real nonresidential fixed investment this year should be very large indeed: 10.3 percent (the previous forecast of the group was 6.3 percent). The boom in exports helps to explain the need for additional productive capacities, but imports of new equipment are sizable, too. Business investment growth is expected to slow to 4.3 percent in 1988:2-1989:2 and 3.3 percent in 1988-9.

### Housing Flat or Slightly Down

New private housing starts likely will remain near the average annual rate of 1.5 million units in both 1988 and 1989, according to the survey's median forecasts. The standard deviations and ranges are about 0.1 and 1.3-1.6, respectively, for both 1989:2 and 1989 as a whole.

Residential investment is expected to decline 1.7 percent in 1987-8, 3.2 percent in 1988:2-1989:2, and 0.5 percent in 1988-9.

### Industrial Production Up, Inventory Investment Down

The index of industrial production is expected to rise 4.8 percent in 1987-8, 2.7 percent in 1988:2-1989:2, and 2.5 percent in 1988-9. The patterns of change in these average forecasts broadly resemble those in the related predictions of net exports and business investment.

Change in business inventories is expected to move down after the recent buildup. The averages in billions of 1982 dollars are 43, 36, and 25 for 1987, 1988, and 1989, respectively.

### Slow Growth of Consumption and Government Purchases

Real consumption expenditures are expected to grow at rates averaging 1.6-2.6 percent in the five quarters through 1989:2 and at 2 percent in both 1987-8 and 1988-9. Most individual forecasts show relatively small deviations from these group averages.

Federal government purchases of goods and services, in constant dollars, are expected to decline in 1987-8 and increase in 1988-9, by less than 1 percent in both cases. State and local government purchases should gain 2.5 percent in 1988 and 2.3 percent in 1989.

### Corporate Profits Strong in 1988, Weaker in 1989

Current dollar aftertax profits are forecast to rise 8.6 percent in 1987-8, which compares favorably with the growth rate of 6.2 percent expected on the average for nominal GNP. This forecast is more than twice as large as the one produced in March. The gains in the near future are predicted to be smaller, however: 4.7 percent for 1988:2-1989:2, 3.9 percent for 1988-9.

### Assumptions

A few forecasters expect some tax rate increases in 1989, but most (12 of them) assume no change in the current law. Defense outlays are predicted to remain at or near their recent level (by six forecasters), to increase 2 percent (by three forecasters), or to decrease 1-5 per-

cent (by eight forecasters). The estimates of growth rates in M1 vary in the ranges of 4–6 percent for 1988 and 5–10 percent for 1989; the corresponding figures for M2 are 6–8 percent and 7–9 percent. Energy prices are expected to be stable or to rise slightly.

*This report summarizes a quarterly survey of predictions by 19 business, academic, and government economists who are professionally engaged in forecasting and are members of the Business and Economics Statistics Section of the American Statistical Association. Victor Zarnowitz of the Graduate School of Business of the University of Chicago and NBER, assisted by Robert E. Allison and Deborah A. Nicholson of NBER, was responsible for tabulating and evaluating this survey.*

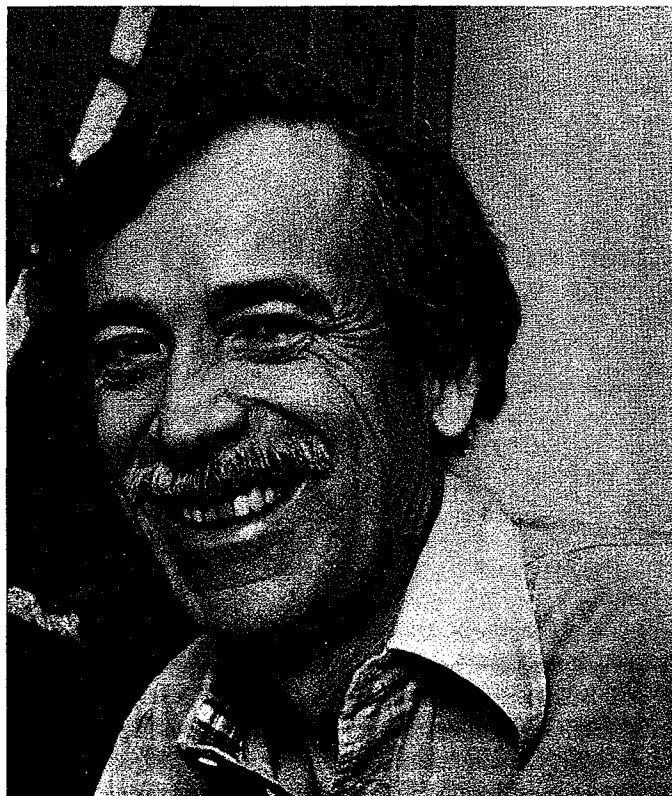
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## NBER Profiles

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### Richard A. Easterlin

Richard A. Easterlin, whose affiliation with the NBER dates back to 1955, is a professor of economics at the University of Southern California. He was elected to the NBER's Board of Directors in 1986 as a representative of the Economic History Association.

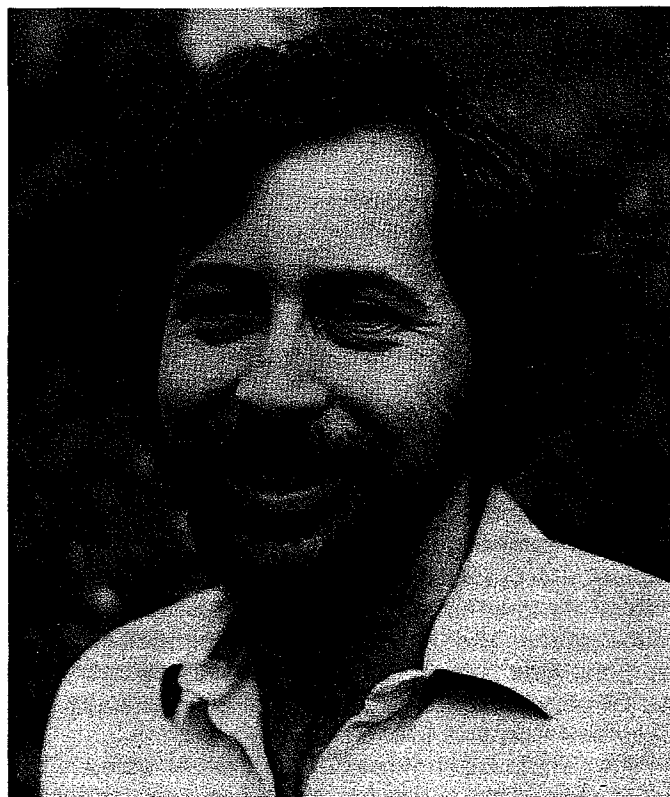


Easterlin received his M.E. from Stevens Institute of Technology in 1945 and his A.M. in 1949 and his Ph.D. in 1953 from the University of Pennsylvania. Before joining the USC faculty in 1982, Easterlin was a professor, department chairman, and associate dean at the University of Pennsylvania. He also has been a visiting professor at Texas A & M University, Stanford University, and the University of Warwick, England.

Easterlin is a Fellow of the Econometric Society and the American Academy of Arts and Sciences, and is currently a Guggenheim Fellow. He was president of the Economic History Association in 1979–80 and the Population Association of America in 1978. Easterlin's research in economic history and economic demography has been published in numerous journals and books, including several of the NBER, where he was a member of the research staff from 1955 to 1966.

### Kevin Lang

Kevin Lang is a faculty research fellow in the NBER's Program in Labor Studies and an associate professor of economics at Boston University. Lang holds a B.A. from Oxford University, an M.Sc. from the Université de Montreal, and a Ph.D. in economics from MIT.



Before joining the B.U. faculty in 1987, he was an assistant professor at the University of California at Irvine. During the 1986–7 academic year, Lang was an NBER Olin Fellow; in 1987 he was named an Alfred P. Sloan Foundation Faculty Research Fellow.



Lang's work in labor economics has been published in a number of professional journals and books. He was also coeditor of the 1987 volume *Unemployment and the Structure of Labor Markets*.

Lang's wife, Shulamit Kahn, also teaches economics at Boston University and is an NBER research economist. They live in Brookline with their two-year-old daughter, Ariela.

## Douglas D. Purvis

Douglas D. Purvis, a member of the NBER's Board of Directors and Executive Committee since 1984, is professor and head of the Department of Economics at Queen's University in Kingston, Canada.



Purvis was born in Olds, Alberta, Canada in 1947. He received a B.A. from the University of Victoria in 1967, an M.A. from the University of Western Ontario in 1968, and a Ph.D. from the University of Chicago in 1973.

Prior to becoming head of the Department of Economics at Queen's, Purvis served a three-year term as director of the John Deutsch Institute for the Study of Economic Policy. From August 1985 to February 1987 he was Clifford Clark Visiting Economist at the Department of Finance in Ottawa. From 1982-4 he was a member of the Minister's Economic Advisory Panel, Department of Finance, and the Research Advisory Group of the Macdonald Royal Commission. He also has been a visiting economist at the Reserve Bank of Australia, the Institute for International Economics in Stockholm, the Cowles Foundation for Research in Economics at

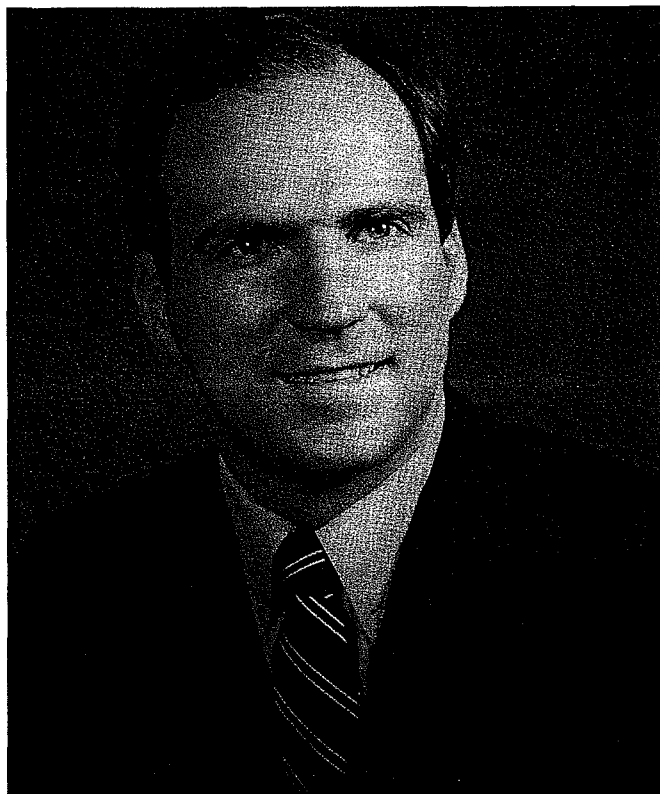
Yale University, and the Graduate Institute for International Studies in Geneva, Switzerland.

Purvis is an associate member of the Institute for Monetary and Fiscal Policy in Tokyo, and has served as a consultant to the Bank of Canada, the Federal Department of Justice, the government of British Columbia, and numerous private organizations. His articles, which focus on macroeconomic theory and international policy issues, have appeared in a number of professional journals.

Purvis is married with two children, Jaime and Joshua. He enjoys tennis, skiing, astronomy, and golf.

## David Romer

David Romer is a faculty research fellow in NBER's Program in Economic Fluctuations. He was valedictorian of the 1980 class at Princeton University and received his Ph.D. in economics from MIT in 1985.



This academic year, Romer has been on leave from Princeton University as a visiting scholar at the NBER and a visiting assistant professor at MIT. In September, he will become an acting associate professor at the University of California at Berkeley.

Romer specializes in macroeconomics and monetary theory. His research has been published in a number of journals and in the NBER Working Papers Series. In addition, he was a junior economist at the Council of Economic Advisers in 1980-1.

Romer's wife, Christina, also is an economist. Their daughter, Katie, was two years old in June.

# Conferences

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## Inter-American Seminar on Economics

On March 17-19, the first annual meeting of the Inter-American Seminar on Economics (IASE) took place in Mexico City. IASE brought together about 50 North American and Latin American economists from academic, multinational, and government institutions. It was cosponsored by the NBER and the Pontificia Universidade Catolica do Rio de Janeiro (PUC-RJ), Brazil. The Mexico City meeting was hosted by the Instituto Autonomo Tecnologico de Mexico (ITAM) and was partially financed by the Rockefeller Foundation and the Ford Foundation. Organizers Sebastian Edwards of the NBER and the University of California at Los Angeles and Edmar Bacha of the PUC-RJ, put together the following program:

Opening Remarks: Javier Beristain, Rector, ITAM

Andrew Berg, MIT, and Jeffrey D. Sachs, NBER and Harvard University, "The Debt Crisis: Structural Explanations of Country Performance" (NBER Working Paper No. 2607)

Discussants: Marcelo Selowsky, The World Bank, and Ernesto Zedillo, Secretaria de Programacion y Presupuesto, Mexico

Sweder J. G. van Wijnbergen, NBER, Center for Economic Policy Research, and The World Bank, "Monopolistic Competition, Credibility, and the Output Costs of Disinflation Programs: An Analysis of Price Controls"

Discussants: Raul Ramos, Banco de Mexico, and Roberto Villareal, El Colegio de Mexico

Miguel A. Rodriguez F., Institute for International Economics and IESA, Mexico, "The Flawed Adjustment of the Venezuelan Economy"

Discussants: José Antonio Ocampo, Fedesarrollo Colombia, and Fernando Sánchez Ugarte, Director General de Ingreso, SHCP, Mexico

Panel Discussion: Pedro Aspe Armella, Minister of Budget and Programming, Mexico; Herminio Blanco-Mendoza, Economic Advisor to the President of Mexico; Francisco Gil Diaz, Director, Banco de Mexico; and Carlos Hurtado, ITAM, "Mexico's Adjustment Plan and the Balance of Payments"

Paul R. Krugman, NBER and MIT, "Financing versus Forgiving a Debt Overhang" (NBER Working Paper No. 2486)

Discussant: Allen Sangines, ITAM

Sebastian Edwards, "Real and Monetary Determinants of Real Exchange Rate Behavior: Theory and Evidence from Developing Countries"

Discussants: Ignacio Trigueros, ITAM, and Nisso Bucacay, El Colegio de Mexico

Guillermo Calvo, University of Pennsylvania, "Idiosyncratic Expectations and Economic Fluctuations: Weakness of Fundamentals When Policy Is Adaptive"

Discussants: Herminio Blanco-Mendoza, and Manuel Sánchez, Universidad Autonomo de Nueva León, Mexico

Alejandro Pérez López, ITAM, "The Debt Problem and the Current Account in a Theory of Finance"

Discussants: Daniel Heymann, Economic Committee for Latin America and the Caribbean (ECLAC), Buenos Aires, and Manuel Marfán, Corporacion de Investigaciones Economicas para Latinamerica (CIEPLAN), Chile

Gustavo Petricoli Iturvide, Minister of Finance and Public Credit, "Mexican Economic Policy and the Debt Problem"

Juan-Antonio Morales, Universidad Catolica Boliviana, "Adjustment and Growth in a Hyperinflation: A Case of Bolivia"

Discussants: Edmar Bacha, and Arturo Fernandez, ITAM

Rubens Penha Cysne, Carlos Ivan Simonsen Leal, and Sergio Ribiero da Costa Werland, Getulio Vargas Foundation, Brazil, "Macroeconomics with Rationing: A Simplified Model for the Open Economy"

Discussant: Sebastian Edwards

Herminio Blanco-Mendoza, and Peter M. Garber, Brown University, "Mexican Stabilization Program: A Case of Stabilization with Exchange Rate Management"

Discussants: Andres Bianchi, ECLAC, Chile, and José Pablo Arellano, CIEPLAN

Ricardo Ffrench-Davis, CIEPLAN, and Manuel Marfán, "Efficient Discriminatory Policies under a Structural Foreign Exchange Shortage"

Discussant: Angel Palerm, Centro de Investigacion y Docencia Economica, Mexico

Berg and Sachs ask whether the LDC debt crisis was the result mainly of external shocks, internal policy mistakes, the organization of political power within the debtor countries, or other structural features of the economies that succumbed to the crisis. Contrary to other studies on the subject that focus mainly on financial variables, this paper looks at more fundamental determinants, such as the orientation of the trade regime, the structure of income distribution, and the degree of urban bias. The results support the hypothesis that structural variables indeed have been related to foreign debt difficulties in LDCs.

Van Wijnbergen's work is motivated by the recent experiences of Brazil, Argentina, and Israel; these three countries used price controls as part of disinflation programs in 1985-6. This paper analyzes asset price behavior during disinflation programs with and without price controls and considers the influence of credibility problems on nominal and real interest rates and the stock market. Van Wijnbergen shows that if past government policy contains information about future government policy, then cheating on current announcements of tight policy buys current employment gains during the price control period at the cost of higher inflation afterward. Sustaining low inflation after the price control period requires restrictive monetary policy during the price control period.

Rodriguez reviews the origins of the Venezuelan debt crisis as well as the adjustment that followed it in 1983-7. He first asks why Venezuela was affected by the debt shock, in spite of the oil boom of the 1970s. Rodriguez points out that capital flight played a key role in the unleashing of the Venezuelan crisis. He criticizes the adjustment effort, based on overly contractionary policies, for not solving the capital flight problem and for resulting in a severely regressive income distribution.

During the panel discussion, Aspe Armella, Blanco-Mendoza, Gil Diaz, and Hurtado reviewed the prospects for Mexico's new National Solidarity Plan and its likely effects on Mexican growth and the balance of payments.

Krugman examines the trade-offs facing creditors of a country whose debt is too large to allow it to attract voluntary new lending. If the country is unable to meet its debt service requirements out of current income, the creditors will have two choices: they can *finance* the country, lending at an expected loss in the hope that the country eventually will be able to repay its debt after all; or they can *forgive*, reducing the debt level to one that the country can repay. Financing gives the creditors an option: if the country turns out to do relatively well, creditors will not have written down their claims unnecessarily. However, the burden of debt distorts the country's incentives, since the benefits of good performance largely go to creditors rather than to the country itself. Krugman finds that the trade-off between financing and forgiveness can be improved if both depend on external forces that the country cannot affect, such as oil prices, world interest rates, and the like.

To analyze movements in real exchange rates, Edwards develops a model of an economy with three goods, a dual nominal exchange rate regime, and an active government. Using data for a group of 12 countries, he finds that short-run movements in the real exchange rate have responded to both nominal and real disturbances. In particular, expansive and inconsistent macroeconomic policies inevitably have generated forces toward real overvaluation. The autonomous forces that move the real exchange rate back to equilibrium also operate fairly slowly, maintaining the country out of equilibrium for a long period of time.

Calvo notes that monetary and fiscal policies often are geared toward full employment and other social objectives, departing significantly from the usual textbook fiction that assumes that they can be determined exogenously by policymakers, and that some market participants, possibly a tiny majority, follow rule-of-thumb forecasting rules. When economic policy is so adaptive that the economic system lacks an anchor in a fundamental sense, then equilibrium could be determined by "idiosyncratic expectations" that differ from "fundamentals." In such cases, models that emphasize fundamentals cannot predict the behavior of the economy.

Pérez López develops a model of a small open economy and analyzes the effectiveness of a debtor country of: 1) debt renegotiation and swap operations in increasing national wealth (and welfare); 2) a reduction in government expenditure, compared to a reduction in the budget deficit, in diminishing its external debt; and 3) a policy of debt relief in raising national wealth (and welfare) and in reducing the need for additional external debt. Pérez López shows that it is crucial to make a distinction between permanent and temporary shocks when analyzing debt and other issues related to the current account.

Iturvide discussed the problems created by Mexico's large foreign debt and reviewed the economic policies of the past few years. He concluded with a brief outlook of future developments in Mexico.

Morales examines the problems of external adjustment and growth following the hyperinflation stabilization in Bolivia. He argues that stopping the hyperinflation stabilization was a precondition for the resumption of growth in Bolivia. The reduction of uncertainty that came along with stabilization was almost immediate in some production sectors. The fall in inflation was also crucial to normalizing relations with official international creditors.

Cysne develops a model with nonclearing prices that is motivated by the experience of some Latin American countries, where prices have been fixed for some period of time as part of stabilization efforts. He uses the model to analyze the behavior of some macroeconomic variables (income, employment, balance of payments, interest rates) under the regimes of excess demand. Cysne shows that these conditions lead to results that differ from those of conventional macroeconomic analyses.

Blanco-Mendoza and Garber discuss the causes and consequences of the stock market collapse in Mexico. They use models that analyze security pricing in the presence of stop-loss trigger strategies. They also present data on the effects of changing price volatility on stock market prices and on the percentage of stocks traded on the Mexican stock exchange that were financed through margin contracts.

Ffrench-Davis and Marfán analyze macroeconomic adjustment in a country with a quantitative foreign exchange shortage. They argue that under such circumstances, exchange rate policy (that is, devalua-

tion) can be overly restrictive, imposing undue costs of adjustment. Discriminatory policies, including trade taxes and subsidies, can minimize these adjustment costs.

Also attending the meeting were: José Córdoba, Institutional Revolutionary Party; Martin Feldstein, NBER; Albert Fishlow, University of California at Berkeley; Laul Lizondo, International Monetary Fund; Eliezer Morales, UNAM; Adalberto Garcia Rocha and Saúl Trejo, The College of Mexico; Leopoldo Solía, Economic Advisor to the President; Luiz Téller, Advisor to the SPP; and Miguel Urrutia, Interamerican Development Bank.

The papers will be published in Spanish in a special issue of *El Primestre Económico*. Selected papers also will appear in English in the *Journal of Development Economics*.

## Trade Policies for International Competitiveness

Nearly 100 economists from the United States, Canada, Mexico, and South America attended a Universities Research Conference on "Trade Policies for International Competitiveness" in Cambridge on April 29 and 30. Research Associate Robert C. Feenstra of the University of California at Davis organized the following program:

Lawrence H. Goulder, NBER and Harvard University, and Barry J. Eichengreen, NBER and University of California at Berkeley, "Savings Promotion, Investment Promotion, and International Competitiveness" (NBER Working Paper No. 2635)

Discussants: Wing T. Woo, University of California at Davis, and David Roland-Holst, Mills College

Edward John Ray, Ohio State University, "The Determinants of Foreign Direct Investment in the United States: 1979-1985"

Discussants: Keith Maskus, University of Colorado, and James Levinsohn, University of Michigan

Panel Discussion: Paul R. Krugman, NBER and MIT, Robert Z. Lawrence, The Brookings Institution, and Laura Tyson, University of California at Berkeley, "U.S. Prospects and Policy Options"

Lawrence F. Katz and Lawrence H. Summers, NBER and Harvard University, "Industry Wage Differentials, International Competition, and Trade Policy"

Discussants: Kenneth A. Froot, NBER and MIT, and Raquel Fernandez, NBER and Boston University

Robert Driskill and Stephen McCafferty, Ohio State University, "Dynamic Duopoly with Output Adjust-

ment Costs in International Markets: Taking the Conjecture Out of Conjectural Variations"

Discussants: Elias Dinopoulos, Michigan State University, and Ronald Fischer, University of Virginia

Gary R. Saxonhouse, University of Michigan, "Differentiated Products, Economics of Scale, and Access to the Japanese Market"

Discussants: Laura Tyson, and Harry Bowen, NBER and New York University

Catherine L. Mann, The World Bank, "Macroeconomic Consequences of Market Power in International Trade"

Discussants: Howard Gruenspecht, Carnegie-Mellon University, and Kwok-Chiu Fung, Mount Holyoke College

Lawrence Schembri, Carleton University, "Export Prices and Exchange Rates: An Industry Approach"

Discussants: Alberto Giovannini, NBER and Columbia University, and Catherine G. Morrison, NBER and Tufts University

Drusilla K. Brown, Tufts University, and Robert M. Stern, University of Michigan, "Computational Analysis of the U.S.-Canadian Free Trade Agreement: The Role of Product Differentiation and Market Structure"

Discussants: Robert W. Staiger, NBER and Stanford University, and John Whalley, NBER and University of Western Ontario

Because of their implications for international capital flows, policies that promote saving and those that promote investment may have very different effects on exchange rates and on the viability of export-oriented and import-competing industries. Goulder and Eichengreen's model combines a detailed treatment of industry interactions, attention to adjustment dynamics, and an integrated treatment of current and capital account transactions to investigate these effects in both the short and long run. They show that the impacts on export industries differ fundamentally depending on whether there is international capital mobility. In the absence of such mobility, both saving- and investment-promoting policies have effects on U.S. export industries that are substantial in the short run and larger and beneficial in the long run, reflecting a general increase in the productivity of the U.S. economy. With international capital mobility, however, subsidizing saving helps U.S. export industries initially but hurts them over the longer term. The reverse is true for investment subsidies. These differences stem from very different implications of the two types of policies for the capital account of the balance of payments.

Ray investigates the determinants of foreign direct investment in the United States in recent years. He uses data on individual investments in the United States during 1979-85, identified by four-digit SIC codes. He finds that investments in general were stimulated by relative economic growth in the United States and timed to take advantage of a weak U.S. dollar. Investments

from all countries and from Japan, the European Community, and Canada tended to be in the same product lines as production by the parent company. Manufacturing investment occurred primarily in R and D-intensive and capital-intensive industries whose markets are not concentrated and in which there is no evidence of scale economies. Manufacturing investment proved to be significantly related to industry growth.

In the panel discussion, Krugman characterized foreign direct investment as a symptom of economic decline in the host country. He noted that the position of the United States in that regard has been reversed since the 1970s when it invested heavily in the Third World. He warned that, in an attempt to regain economic supremacy, the United States may become like France: addicted to the promotion of large, fashionable high tech industries. This would be manifest in a movement toward a national industrial policy and managed foreign investment.

Lawrence then discussed the congressional trade bill. Since it would incorporate safety valves and be temporary, it probably distorts trade less than quotas and cartels do. Moreover, the administration needs congressional backing to enter the next round of trade negotiations, so passage of some trade bill is important.

Tyson pointed out that competitiveness is not solely related to exchange rates, nor simply a question of catching up with other countries. She suggested that improved competitiveness might require: more careful study of labor/management issues and the management of human resources within firms; analysis of the link between firm ownership and the cost of capital; and cooperative research among firms, perhaps through new institutions like Sematech.

In their paper, Katz and Summers examine the relationship between labor market imperfections and trade policies. The evidence suggests that pervasive industry wage differentials, of up to 20 percent, remain even after differences in workers' skills and the effects of unions are taken into account. Accordingly, policies directed at encouraging employment in high-wage sectors could enhance allocative efficiency significantly. For the United States and other developed countries, such policies are more likely to involve export promotion than important substitution. Contrary to widely expressed concerns, it does not appear (at least through 1984) that the United States has been losing its relative position in high-wage industries.

The size of recent U.S. trade deficits has intensified interest in the appropriate role of government in promoting export industries. Driskill and McCafferty reexamine this question in the context of a highly concentrated domestic industry competing with a similarly concentrated counterpart industry for export business in the rest of the world. Their analysis recognizes the possibility of significant costs of changing output levels too rapidly. Such costs seem to make the domestic industry too hesitant to exploit its market power fully internationally. Therefore, a domestic export sub-

sidy increases the industry's contribution to national product.

For much of the past 35 years, Japan has imported a remarkably small share of the manufactured goods it consumes. Some observers believe that, despite the absence of formal barriers, foreign manufacturers are denied access to the Japanese market systematically. Saxonhouse shows that Japan's interindustry trade structure can be explained largely by Japan's distinctive pattern of factor endowments. Japan's participation in intraindustry trade in manufactures is also extremely low. Yet Saxonhouse shows that Japan's intraindustry trade conforms to international patterns. He suggests that the removal of the remaining Japanese barriers to the import of manufactures may have little impact on Japanese trade structure.

Mann analyzes how deviations from world prices and perfect competition in the export sector affect prices and wages, as well as macroeconomic measures of performance such as income, the current account, and the size of the government sector. She finds that monopoly pricing may increase welfare by fully exploiting market power while at the same time minimizing the deleterious effect of market power on the number of firms and resource allocation. However, if the economy is characterized by very different labor intensities in the two sectors, or a very high share of labor income in private sector income, raising export prices may reduce welfare. Thus, developing countries that might be characterized by a less well-developed export sector alongside a large agricultural sector may increase welfare by avoiding the temptation to exploit the foreign elasticity of demand.

Schembri analyzes the "pricing-to-market" behavior of foreign exporters in the U.S. market. He examines the market power of a major Canadian export industry in domestic and export markets and estimates the effect of an exchange rate change on its domestic and export selling prices, output, and input demands. His results indicate the existence of pricing-to-market behavior.

Brown and Stern analyze the economic effects of a free trade agreement between the United States and Canada. They consider three market structures: perfect competition with national product differentiation; monopolistic competition with firm product differentiation; and a national market segmentation model with homogeneous products. They show that monopolistic competition leads to strong interindustry specialization, particularly in Canada. Output in Canada declines in 16 of the 22 tradable sectors and exports decline in 8 tradable sectors. Intersectorial specialization gains are responsible in part for an increase in Canadian welfare of 1.2 percent of GDP, despite the deterioration in Canada's terms of trade. The welfare gain in the United States is also positive but smaller in absolute terms than Canada's.

These papers will be published in an NBER conference volume. Its availability will be announced in a future issue of the *NBER Reporter*.

# World Capital Market Integration

On May 6-7, the NBER held a miniconference in Cambridge on world capital market integration. Research Associate Takatoshi Ito of the University of Minnesota organized the following program:

Robert F. Engle III, NBER and University of California at San Diego; Takatoshi Ito; and Wen-ling Lin, University of California at San Diego, "Meteor Showers or Heat Waves? Heteroskedastic Intradaily Volatility in the Foreign Exchange Market" (NBER Working Paper No. 2609)

Kathryn Mary Dominguez, Harvard University, "The Pricing of Foreign Exchange Risk in the Stock Market: A Test for International Economic Interdependence"

Masahiro Kawai, Johns Hopkins University and University of Tokyo, and Hirohiko Okumura, Nomura Research Institute, "Japan's Portfolio Investment in Foreign Securities"

Kenneth A. Froot, NBER and MIT, and Jeffrey A. Frankel, NBER and University of California at Berkeley, "Findings of Forward Discount Bias Interpreted in Light of Exchange Rate Survey Data"

Takatoshi Ito, "Foreign Exchange Rate Expectations: Micro Survey Data"

Engle, Ito, and Lin define and test a form of market efficiency called market dexterity. It requires that asset prices adjust instantaneously and completely in response to new information. They examine the behavior of the yen/dollar exchange rate while each of the major markets is open in order to test for informational effects from one market to the next. Assuming that news has only country-specific autocorrelation (like a heat wave), any intradaily volatility spillovers (meteor showers) become evidence against market dexterity. Statistical tests lead the authors to reject the heat wave theory and therefore the market dexterity hypothesis.

Dominguez asks whether changes in economic conditions outside the United States lead to significant nondiversifiable risk in U.S. asset markets. She uses exchange rate changes as a measure of innovations in non-U.S. economic performance, examining their influence on asset pricing within a three-factor arbitrage pricing model. The model also includes the market portfolio and changes in interest rates to control for intra-U.S. economic innovations. Dominguez finds that since 1980, exchange rate changes have been priced according to arbitrage pricing theory. Further, exchange rate risk has been higher for firms producing traded goods, and lower for firms producing nontraded goods. This suggests that the risk/return structure in U.S. asset markets is determined in part by the relative performance of foreign economies.

Kawai and Okumura sketch the recent trends and features of long-term capital outflows from Japan, and examine the major determinants of Japan's portfolio investment (flow) in foreign bonds, which have been the dominant form of its foreign investment. They find that Japan's portfolio investment in foreign bonds responded to relative expected returns and exchange risk differently in 1982-3 and 1984-7. In the earlier period, capital outflows responded negatively to the expectation-adjusted interest rate differentials and positively to exchange risk. In the latter period, capital outflows were affected inversely and significantly by exchange risk but were affected positively and insignificantly by interest rate differentials. One interpretation of these results is that when the share of foreign bonds in the portfolio of major investors is relatively small, as in 1982-3, the risk factor does not discourage investment. However, as the share of foreign bonds becomes large, as in 1984-7, investors are increasingly sensitive to the risk of exchange rate fluctuations. Indeed, the possibility of the dollar's collapse began to be discussed around 1984, which caused Japanese investors to be more sensitive to exchange risk than in the earlier period.

Froot and Frankel use survey data on exchange rate expectations to divide the forward discount into expected depreciation and a risk premium. The data suggest that findings of both unconditional and conditional bias are caused overwhelmingly by systematic expectational errors. They find support for the hypothesis of perfect substitutability in that changes in the forward discount reflect changes in expected depreciation on a one-for-one basis. The random-walk view, that expected depreciation is zero, is rejected; expected depreciation is even significantly more variable than the risk premium. Therefore, investors would do better if they always reduced fractionally the magnitude of expected depreciation. This result, that Bilson and many others have found with forward market data, now cannot be attributed to a risk premium.

Ito analyzes panel data from a biweekly survey conducted by the Japan Center for International Finance on the yen/dollar exchange rate expectations of 44 institutions over two years. He finds first that market participants are heterogeneous: that is, there are significant "individual effects" in their formation of expectations. Second, many institutions violate the rational expectations hypothesis. Third, forecasts with long horizons show less yen appreciation than ones with short horizons. The data strongly reject cross-equation constraints implied by the consistency of the forecast term structure.

Also attending the conference were: Brian Bethune, Bank of Montreal; Fabio Canova, University of Minnesota; Susan M. Collins, NBER and Harvard University; Koichi Hamada, Yale University; Angelo Melino, NBER and University of Toronto; and Mikitani Royichi, Kobe University.

# 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 primarily intended 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 Fall 1988 issue of the *Reporter* is September 1. If you have any questions about procedures for submitting materials for the calendar, please call Kirsten Foss Davis at (617) 868-3900.

**August 2-3, 1988**

Latin American Meeting, The Econometric Society\*

**August 8-11, 1988**

Joint Statistical Meetings, American Statistical Association\*

**August 24-25, 1988**

International Trade Seminar, NBER and Center for Economic Policy Research

**September 15-16, 1988**

Panel on Economic Activity, Brookings Institution

**September 25-28, 1988**

81st Annual Conference, National Tax Association-Tax Institute of America\*

**September 25-28, 1988**

Annual Meeting, National Association of Business Economists\*

**October 6-7, 1988**

Annual Conference, International Association of Business Forecasting

**October 7-8, 1988**

Conference on Housing, NBER

**October 14, 1988**

Program Meeting: Economic Fluctuations, NBER

**October 14-15, 1988**

Time Series Seminar, NBER and Conference on Econometric and Mathematical Economics

**October 27-29, 1988**

International Policy Coordination and Exchange Rate Fluctuations, NBER

**October 30-November 2, 1988**

Annual North American Conference, International Association for Energy Economics\*

**November 15, 1988**

Tax Policy and the Economy, NBER

**November 16-17, 1988**

Compensation Policy and Firm Performance, NBER

**November 18, 1988**

Program Meeting: Labor Studies, NBER

**November 20-22, 1988**

Annual Meeting, Southern Economic Association\*

**December 1-2, 1988**

Special Brookings Papers Meeting, Brookings Institution

**December 16-17, 1988**

Universities Research Conference: Financial Markets and Macroeconomic Stability, NBER

**December 28-30, 1988**

Annual Meeting, American Economic Association\*

**January 6-7, 1989**

Conference on Savings, NBER

**January 7-8, 1989**

Labor Relations and Corporate Management: Comparative Perspective, NBER, Center for Economic Policy Research, and TCER

**February 23-26, 1989**

Conference on International Taxation, NBER

**March 10-11, 1989**

Annual Conference on Macroeconomics, NBER

**March 16-19, 1989**

Stock Market Volatility and the Crash, NBER

**March 30-31, 1989**

Second Annual Interamerican Seminar on Macroeconomics, NBER

**August 14-17, 1989**

Joint Statistical Meetings, American Statistical Association\*

**September 17-20, 1989**

Annual Meeting, National Association of Business Economists\*

**October 4-7, 1989**

19th (Biannual) Conference, Center for International Research on Economic Tendency Surveys

**October 8-11, 1989**

82nd Annual Conference, National Tax Association-Tax Institute of America\*

**November 19-21, 1989**

Annual Meeting, Southern Economic Association\*

**September 23-26, 1990**

Annual Meeting, National Association of Business Economists\*

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

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



## International Trade and Finance with Limited Global Integration

### Financial Markets and Macroeconomic Stability: A Call for Papers

On December 16 and 17, 1988, the National Bureau of Economic Research will hold a conference in Cambridge on Financial Markets and Macroeconomic Stability, organized by Ben S. Bernanke. The theme of this conference is the role of financial and credit markets in aggregate economic fluctuations, and in the macroeconomy more generally. A broad range of topics in the overlap of finance and macroeconomics is appropriate. Examples include macroeconomic causes and implications of stock market volatility, bubbles, or fads; macroeconomic effects of financial deregulation and innovation; monetary transmission mechanisms; corporate and household indebtedness; liquidity and borrowing constraints; the stability of the banking system; causes and effects of high real interest rates; real effects of government borrowing and lending; macroeconomic implications of exchange rate volatility and accumulation of international debt. Our goal is to get a good mix of papers. Some priorities will be given to empirically oriented research, but primarily theoretical papers are also welcome.

Papers will be selected on the basis of abstracts of about 500 words or, when possible, completed papers, with preference given to papers by younger members of the profession. Any research that will not have been published at the time of the conference may be submitted. The deadline for submission of abstracts and papers is August 30, 1988. Authors chosen to present papers will be notified by September 15, 1988. The NBER will pay expenses of those chosen to give papers at the conference.

Abstracts and papers should be sent to Professor Ben S. Bernanke, National Bureau of Economic Research, 1050 Massachusetts Avenue, Cambridge, MA 02138.

On February 20, members of the NBER's Program in International Studies held a miniconference in Cambridge on "International Trade and Finance with Limited Global Integration." The motivation for this gathering was the perceived need for international economic models to reflect the less-than-perfect integration among markets in the real world. Organizers Joshua Aizenman of the NBER and Hebrew University of Jerusalem, and Sebastian Edwards, of the NBER and University of California at Los Angeles, chaired the following program:

Maurice Obstfeld, NBER and University of Pennsylvania, and Harold L. Cole, University of Pennsylvania, "Commodity Trade and International Risk Sharing: Do Financial Markets Matter?"

Sebastian Edwards, "Dual Markets and Real Exchange Rates: Preliminary Evidence from Developing Countries"

Joshua Aizenman and Eduardo R. Borensztein, International Monetary Fund, "Debt and Conditionality under Endogenous Terms-of-Trade Adjustment" (NBER Working Paper No. 2582)

Elhanan Helpman, NBER, MIT, and Tel Aviv University, "The Simple Analytics of Debt-Equity Swaps and Debt Forgiveness"

Bernard Dumas, NBER and University of Pennsylvania, and Miland Shrikhande, University of Pennsylvania, "Supplier-Dealers' Relationships under Fluctuating Exchange Rates"

Obstfeld and Cole explore the impact of international financial integration on asset returns and on the comovement of national income account aggregates. They also examine the implications of country-specific tastes, investment, and nonspecialization in the production of tradables and nontradables. Under special circumstances, they find, the efficiency gains from international risk sharing are zero. To the extent that these efficiency gains are small, low transaction costs may explain why current account balances and international portfolio diversification have been rather low even though cross-border correlations between returns on similar assets tend to be high.

Edwards uses a model of real exchange rate behavior in an economy with capital controls and a dual exchange rate system to investigate the determinants of equilibrium and disequilibrium movements by real exchange rates. Using data for a group of twelve developing countries, he finds that short-run real exchange rate movements have responded to both nominal and real disturbances. In particular, expansive and incon-

sistent macroeconomic policies inevitably have generated forces toward real overvaluation. The autonomous forces that move the real exchange rate back to equilibrium operate fairly slowly, ensuring that the country remains out of equilibrium for a long time. If a country is indeed in disequilibrium, nominal devaluations can help greatly to speed up the process of real exchange rate realignment.

Aizenman and Borensztein argue that the international capital market is characterized by effective credit rationing to developing countries. They identify conditions under which renewed lending will benefit both the developed and the developing countries. In the presence of adjustment in endogenous terms of trade, a competitive international banking system may not revitalize lending for investment purposes, even if such renewed lending is socially desirable. Renewed lending may require the appropriate conditionality, and the presence of endogenous terms of trade adjustment puts greater weight on investment conditionality.

Helpman examines debt-equity swaps and debt forgiveness. In the presence of a competitive fringe of creditors, there is a unique price at which a swap of a given size can be performed; the larger the swap, the higher that price. Under these circumstances small swaps may not take place despite the existence of Pareto-improving deals. Voluntary swaps will not take place with discounts on the debt's market value, and voluntary swaps may or may not require discounts on the face value of the debt. A buy-back and debt forgiveness may be very costly, with the major portion of the benefits falling to the creditors (rather than to the debtor). Debt forgiveness may reduce investment in the debtor country, thereby imposing a secondary cost via a reduction of debt service payments. A debt-equity swap also may increase or reduce investment.

Dumas and Shrikhande develop a model that produces a stochastic process for deviations from the Law of One Price (LOP) compatible with capital market efficiency and with the possibility of trade in commodities. Deviations from the LOP depend upon the delay that is needed to ship goods from one country to the other. In each country, the goods are shipped optimally, invested in a random production process yielding real returns, or consumed by the local residents. Under risk aversion, the equilibrium process of deviations from LOP deviations is not a martingale; it exhibits a reversal tendency as well as a fair amount of heteroskedasticity.

Also attending the miniconference were: Susan M. Collins and Kala Krishna, NBER and Harvard University; Enrica Detragiache, University of Pennsylvania; Michael P. Dooley, International Monetary Fund; Rüdiger W. Dornbusch, Kenneth A. Froot, and Paul R. Krugman, NBER and MIT; Leo Lederman, University of Chicago; Richard C. Marston, NBER and University of Pennsylvania; Assaf Razin, NBER and Tel Aviv University; and Sweder J. G. van Wijnbergen, NBER and The World Bank.

## Tax Economists Hold Spring Meeting

Members and guests of the NBER's Program in Taxation met in Cambridge on March 24-25. Program Director David F. Bradford of Princeton University organized the following agenda:

R. Glenn Hubbard, NBER and Northwestern University, and Peter Reiss, NBER and Stanford University, "Tax Changes and the Dividend Decision: Evidence from the U.S. Petroleum Industry"

Discussant: James M. Poterba, NBER and MIT

William Andrews, Harvard University Law School, "Current Issues in the Taxation of Corporate Distributions"

Laurence J. Kotlikoff, NBER and Boston University, "Health Expenditures and Precautionary Savings"

Discussant: Lawrence H. Summers, NBER and Harvard University

Dinner Speaker: Eugene Steuerle, Office of Tax Analysis, U.S. Department of the Treasury

Kenneth L. Judd, NBER and University of Chicago, and David Bizer, Stanford University, "Capital Accumulation, Risk, and Uncertain Taxation"

Discussant: Jeremy I. Bulow, NBER and Stanford University

Roger H. Gordon and Joel B. Slemrod, NBER and University of Michigan, "Do We Collect Any Revenue from Taxing Capital Income?"

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

Panel Discussion: "Tax Return Data for Tax Analysis: Issues and Availability," Fritz Scheuren, Internal Revenue Service; Daniel R. Feenberg, NBER; and Joel B. Slemrod

Myron Scholes, NBER and Stanford University, and Mark A. Wolfson, Stanford University, "Taxes and Organization Theory"

Hubbard and Reiss use data on 26 petroleum firms from 1924 to 1965 to see how dividends respond to changes in shareholder tax rates and taxes on corporations' retained earnings. They focus on the petroleum industry so that they can control adequately for changes in firms' investment opportunities. Within their sample period, there are also interesting tax experiments: for example, the Undistributed Profits Tax of 1936-8, which was a tax on corporate retained earnings. Hubbard and Reiss find that both shareholders' taxes and corporate taxes affect most firms and their dividends. They also find that dividend payments respond asymmetrically to earnings.

Andrews discussed some recent tax legislation. For example, a major provision in the Tax Reform Act of 1986 was repeal of the General Utilities doctrine, under which corporate income tax on unrealized apprecia-

tion on certain corporate assets could be eliminated permanently in various forms of corporate acquisitions. He also discussed the erosion of future corporate income and dividend taxes; this appears to be occurring as a result of acquisitions and other transactions in which corporate equity is transformed into debt, so that future distributions will be deductible interest payments. Proposals to deal with this problem might limit treatment as debt, for tax purposes, to instruments issued to bring new funds or property into corporate solution and deny it for debt issued in exchange for already outstanding stock.

Kotlikoff examines precautionary saving for uncertain health care payments, which could explain a large amount of aggregate savings. Adding uncertain health expenditures to the economy in his model raises long-run savings by almost one-third. Introducing actuarially fair insurance to the economy with uncertain health expenditures reduces the steady-state level of wealth of that economy by 12 percent. Switching from the fair insurance arrangement to a Medicaid type of program with an asset test further reduces steady-state wealth by 75 percent.

In his remarks, Steuerle focused on likely future directions for tax policy and their connection to recent changes in tax laws. For instance, the decline in the value of the personal exemption over the last several decades led to initiatives for the family and low-income workers in recent tax reform. Future changes in the budget, taxes, and welfare are also likely to be concerned with the net burden on families and low-income workers.

Similarly, recent reductions in the ratio of debt to GNP change the nature of the tax and expenditure recommendations that are likely to come out of any budget commission. Steuerle indicated that there is a strong movement against major changes in the tax code during the next few years. Nonetheless, since so much of economic and social policy flows through the tax code, tax policy will be involved intimately in other initiatives, such as budget, health, and welfare reform.

Judd described his work with Bizer on developing models of taxation and capital formation that include uncertainty in tax policy and investment returns. They apply their model to some interesting examples; for instance, they show that, for a given cost of capital, enactment of a high investment tax credit will lead to more volatility in output over the business cycle.

Gordon and Slemrod estimate the revenue and distributional effects of tax arbitrage. Using tax data from 1983, they focus on two tax changes that would each substantially reduce the opportunities for tax arbitrage. They find that taxing real rather than nominal interest income would have raised government revenue in 1983 by \$25.5 billion. This increase in revenue would have occurred mainly at the expense of those in the highest tax brackets. Taxing the cash flow from real capital, and exempting from tax any income from financial assets, would have raised government revenue by \$17.4 billion. Since this tax change eliminates

all distortions to savings and investment decisions, the tax law in 1983 subsidized savings and investment on average, Gordon and Slemrod find.

In designing an organization, tax considerations and information-related transaction costs often conflict with one another. Scholes and Wolfson model such conflicts in a variety of specific settings, including: employee compensation transacting; customer and supplier contracting; risk sharing among members in a joint venture; and oil and gas exploration. In each setting, the tax-planning opportunity arises because of differences in tax rates across: taxpayers, time periods, economic activities, legal organizational forms, or jurisdictions. Moreover, contracting problems arise because of costs associated with risk sharing, hidden action, or other hidden information factors. Because of these costs, tax minimization is far different from efficient tax planning. As a result, tax specialists, observing that firms fail to implement certain tax-minimizing strategies, possess far less valuable information than the potential tax savings might suggest. Similarly, to organizational theorists who view taxes as a nuisance to be avoided at any price, these models suggest that organizational responses to changes in tax laws are much greater than they think. Moreover, taxes interest them precisely because the organizational responses to tax changes are smaller than suggested by tax minimization alone.

Also attending the conference were: Michael J. Boskin and John B. Shoven, NBER and Stanford University; Charles T. Clotfelter, NBER and Duke University; Don Fullerton and Jonathan S. Skinner, NBER and University of Virginia; Martin Feldstein, Lawrence H. Goulder, and Louis Kaplow, NBER and Harvard University; Jerry A. Hausman, NBER and MIT; Patric H. Hendershott, NBER and Ohio State University; James R. Hines, Jr., and Joseph E. Stiglitz, NBER and Princeton University; Andrew B. Lyon, NBER and University of Maryland; Gilbert Metcalf, Harvard University; Robert Merrill, Joint Committee on Taxation, U.S. Congress; Robert Moffitt, NBER and Brown University; Fabio Schiantarelli, Boston University; and Emil Sunley, Deloitte Haskins & Sells.

## Workshop on Macroeconomic History

An NBER workshop on macroeconomic history was held in Cambridge on April 15. Organized by Olin Fellows N. Gregory Mankiw of Harvard University and Christina D. Romer of Princeton University, the program was:

Robert B. Barsky, NBER and University of Michigan,  
and J. Bradford De Long, NBER and Boston Univer-

sity, "Forecasting Pre-World War I Inflation: The Fisher Effect Revisited"

Discussant: Robert J. Barro, NBER and Harvard University

Alexander J. Field, Santa Clara University, "Bankruptcy, Debt, and the Macroeconomy: 1919-1946"

Discussant: Barry J. Eichengreen, NBER and University of California at Berkeley

Kathryn M. Dominguez, Harvard University, and Ray C. Fair and Matthew D. Shapiro, NBER and Yale University, "Forecasting the Depression: Harvard versus Yale" (NBER Working Paper No. 2095)

Discussant: Jeffrey A. Miron, NBER and University of Michigan

Christina D. Romer, "The Great Crash and the Onset of the Great Depression"

Discussant: Ben S. Bernanke, NBER and Princeton University

Stephen G. Cecchetti, NBER, Ohio State University, and New York University, "Deflation and the Great Depression"

Discussant: James D. Hamilton, University of Virginia

Richard C. Sutch, University of California at Berkeley, "The Ineffectiveness of Monetary Policy during the Great Depression: The Crisis of Liquidation in the United States at Certain Dates in 1932"

Discussant: Martin S. Goodfriend, Federal Reserve Bank of Richmond

Barsky and De Long consider the puzzling behavior of interest rates and inflation in the United States and the United Kingdom prior to World War I, and particularly between 1879 and 1913. Apparently, a deflationary regime prior to 1896 was followed by an inflationary one from 1896 to 1913: the average inflation rate in the United States was 3.8 percentage points higher in the second period than in the first. Was the change in regime perceived, or should it have been, by agents at the time? Because the price level was nearly a random walk during the period, past inflation did not predict future inflation. If inflation could not be forecast, then there was no reason to expect it to be correlated with interest rates. However, Barsky and De Long show that inflation could be forecast on the basis of lagged gold production figures that were published regularly in the *The Economist*. They estimate that agents' expectations of inflation, and therefore of nominal interest rates, should have risen by at least three percentage points in the United States from 1896 to 1913.

Field analyzes data on federal bankruptcy at the national, state, and judicial district level. He summarizes the legal history needed to interpret these data; surveys and critiques prior views of the bankruptcy process; and presents empirical results demonstrating that fluctuations in bankruptcy rates are related systematically to other macroeconomic variables, such as income (inversely) and debt (positively). The extraordinary boom in structural capital formation that took

place during the 1920s may be associated not only (and obviously) with the growth in private debt, but also with slowed growth and eventual decline of income. This decline may have resulted from a progressive deterioration in the care with which long-lived and irreversible investment decisions were made.

Dominguez, Fair, and Shapiro find that neither the onset nor the persistence of the decline in the economy in the early 1930s could have been predicted from the data available in the 1920s. Modern statistical analysis also would have produced optimistic forecasts for that period. The authors base their result partly on data from Harvard's forecasting service, begun in 1919, which produced weekly reports on a stock price index, bank lending, interest rates, and commodity prices. Harvard also produced short and medium-term forecasts of the economy. The authors also study Yale's service, begun in 1923, which issued weekly reports on stock and commodity prices and discussions of current economic issues.

Romer examines a possible link between the Great Crash of the stock market in October 1929 and the decline in real output in the first year of the Great Depression. She argues that the collapse of stock prices caused consumers to become very uncertain about the course of future income. This uncertainty led consumers to delay spending on durable and semidurable goods as they waited to see if the economy would weather the financial crisis or slip into a depression. The resulting collapse of spending had the effect of driving down income and output in late 1929 and much of 1930. The decline in sales of durable goods, and changes in the composition of retail sales and commodity output in the months immediately following the Great Crash, are evidence that uncertainty affected consumer behavior.

Cecchetti investigates Irving Fisher's debt-deflation theory of the Great Depression. He asks whether the deflation of the early 1930s could have been anticipated and why there was no depression following the 16 percent deflation of 1920-2. Data on prices and interest rates show that the deflation of the 1930s *could* have been anticipated. But private debt did not increase sufficiently from 1922 to 1929 to explain why one deflation was followed by a boom while the other was followed by a bust. Cecchetti provides a new interpretation of the deflation of the 1930s, concentrating on the consequences of anticipated deflation. He shows how temporary declines in money growth can lead to a collapse in both consumption and investment.

Sutch studies the impact of Federal Reserve open market operations during the Great Depression. Keynes suggested that the U.S. "liquidity crisis" of October and November 1932 was evidence that monetary policy could become powerless to stimulate recovery during a deep depression. By reviewing movements in monetary aggregates, the term structure of interest rates, and bank portfolios, Sutch finds that the liquidity trap was encountered at various times during the Great

Depression, including in 1932, and again on several occasions in 1938, 1939, and 1940.

Also attending the workshop were: Michael D. Bordo, NBER and Carnegie-Mellon University; Charles W. Calomiris, Northwestern University; Geoffrey Carliner, NBER; Gregory Clark and David R. Weir, Stanford University; Robert E. Gallman, NBER and University of North Carolina; Robert J. Gordon, NBER and Northwestern University; John A. James, University of Virginia; Levis Kochin, University of Washington; Eugene N. White, Rutgers University; and Jeffrey G. Williamson, Harvard University.

## Program Meeting on International Taxation

The NBER held a meeting of the research group on International Taxation in the Cambridge office on April 21-22. The meeting was funded by a grant from the Ford Foundation. NBER Research Associates Joel B. Slemrod of the University of Michigan and Assaf Razin of Tel Aviv University organized the following program:

Michael P. Dooley and Peter Isard, International Monetary Fund, "International Capital Accumulation and Exchange Rate Determination in an Optimizing Model in Taxation and Debt"

Discussant: Charles M. Engel, NBER and University of Virginia

Kala Krishna, NBER and Harvard University, and Marie C. Thursby, NBER and University of Michigan, "Optimal Policies with Strategic Distortions" (NBER Working Paper No. 2527)

Discussant: James A. Levinsohn, University of Michigan

Alberto Giovannini, NBER and Columbia University, "International Capital Mobility and Tax Evasion" (NBER Working Paper No. 2460)

Discussant: Joel B. Slemrod

Jonathan Eaton, NBER and University of Virginia, and Mark Gersovitz, Princeton University, "Country Risk and the Organization of International Capital Transfer" (NBER Working Paper No. 2204)

Discussant: R. Glenn Hubbard, NBER and Northwestern University

Charles E. McLure, Jr., NBER and Stanford University, and John H. Mutti, Grinnell College, "Foreign Tax Implications of Direct Consumption Taxes"

Discussant: Daniel Frisch, NBER and U.S. Department of the Treasury

Dooley and Isard relate changes in relative prices, exchange rates, and external imbalances to shifts in the desired location of asset holdings. They emphasize that jumps in exchange rates can be associated with fiscal developments that change the relative strengths of incentives to accumulate capital in different countries. Exchange rate overshooting can reflect the slow adjustment of real variables—in particular, the time it takes to increase output through capital formation. Dooley and Isard contend that most disturbances to the world economy require an adjustment in one or more of the fiscal policy variables that enter government budget identities (that is, tax rates, spending parameters, or debt levels) and thereby may influence exchange rates by affecting expectations of the relative returns to capital in different countries.

Recent work on optimal trade policy for imperfectly competitive markets identifies the optimal level of only one policy instrument; when more than one instrument is allowed, it is not possible to make general interpretations. In their paper, Krishna and Thursby analyze the jointly optimal levels of a variety of instruments with oligopolistic competition. They derive a targeting principle for identifying optimal policies using the concept of a "strategic distortion." Optimal policies vary with the distortions present and with the number of firms, as well as with assumptions about market segmentation and regulation. They illustrate the principles of targeting using agricultural marketing boards.

Giovannini studies the welfare effects of international investment undertaken to evade domestic taxes on domestic investment income. Capital mobility used for tax evasion eliminates distortions in the intertemporal allocation of consumption but introduces distortions in domestic production. Conversely, a regime where residents pay taxes on all investment income, domestic and foreign, introduces distortions in intertemporal consumption allocation but leaves domestic production free of distortion. The relative magnitudes of the interest elasticity of savings and the interest elasticity of domestic investment determine the welfare effects of capital movements for the purpose of tax evasion.

Foreign portfolio investment is threatened by the risk of default and repudiation, while direct foreign investment is threatened by the risk of expropriation. These two contractual forms of investment can differ substantially in the amount of capital they can transfer from abroad to capital-importing countries, the shadow cost of capital, and their implications for the tax policy of the host. Eaton and Gersovitz find that the interaction of public borrowing from abroad with investments abroad by private citizens can imply multiple equilibriums with very different consequences for welfare. One equilibrium involves private inflows and repayment of public debt; another is characterized by capital flight and default.

Would a U.S. corporation be able to claim a foreign tax credit against any U.S. tax liability on income received from a foreign affiliate? If a credit were not grant-

ed, would the U.S. parent face a major penalty of double taxation of income earned in that country? McLure and Mutti consider various legal interpretations that might justify a positive or negative ruling over creditability. They assess the importance of the creditability issue by comparing the aftertax return to foreign investment under three regimes: 1) a foreign income tax; 2) a foreign cash flow tax that is creditable; and 3) a foreign cash flow tax that is not creditable. The affiliate's reliance on debt finance, the foreign tax rate (the corporate level tax and any withholding tax on dividend remittances), and the extent to which the investment earns more than a marginal return all are allowed to vary. While these distinctions are important, a more fundamental issue is whether the U.S. parent initially has a surplus of foreign tax credits from other foreign source income or whether it initially pays a residual U.S. tax on foreign source income. In the former case, the loss of foreign tax creditability on a small portion of foreign income received has no effect on the total tax burden of the U.S. parent, because any additional liability is offset by existing excess credits. If the parent is in a deficit foreign tax credit position, however, the loss of creditability reduces the attractiveness of foreign investment considerably. Because of the statutory corporate tax rate reduction in the 1986 Tax Reform Act, 70 percent of the foreign income received by U.S. parent corporations in manufacturing is likely to be accounted for by companies in excess foreign tax credit positions. Thus, the uncertainty posed by a possible loss of creditability under a cash flow tax should not be overstated.

The following people also attended the meeting: Eric Bond, Pennsylvania State University; Lans Bovenberg, International Monetary Fund; David F. Bradford and James R. Hines, Jr., NBER and Princeton University; Neil Bruce and Douglas D. Purvis, Queen's University; Geoffrey Carliner, NBER; Susan M. Collins and Lawrence H. Goulder, NBER and Harvard University; Jorge de Macedo, NBER and New University of Lisbon; Roger H. Gordon and Jeffrey K. MacKie-Mason, NBER and University of Michigan; Harry Grubert, U.S. Department of the Treasury; Douglas Holtz-Eakin, NBER and Columbia University; Laurence J. Kotlikoff, NBER and Boston University; Pradeep Mitra and Jesus Seade, The World Bank; Efraim Sadka, Tel Aviv University; Jonathan S. Skinner, NBER and University of Virginia; Sweder J. G. Wijnbergen, NBER and The World Bank; Robert Weiner, Brandeis University; John Wilson, Indiana University; and Kar-Yio Wong, University of Washington.

## Labor Economists Meet In Cambridge

About 30 members and guests of the NBER's Program in Labor Studies met in Cambridge on April 29. Program Director Richard B. Freeman, NBER and Harvard University, organized the following agenda:

Katharine G. Abraham, NBER, University of Maryland, and The Brookings Institution, and Susan Houseman, University of Maryland, "Employment and Hours Adjustment: A U.S./German Comparison"

Andrew Schotter, New York University, "Asymmetric Tournaments, Equal Opportunity Laws, and Affirmative Action: Some Experimental Results"

Jonathan S. Leonard, NBER and University of California at Berkeley, "Wage Structure and Profit Sharing in the Electronics Industry"

Orley C. Ashenfelter, NBER and Princeton University, James Dow, University of Pennsylvania, and Daniel Gallagher, James Madison University, "Negotiator and Arbitrator Behavior under an Appellate System"

In recent years, there has been growing interest in the United States in strengthened job security for workers. Abraham and Houseman contrast the dynamics of employment and hours adjustment in Germany—a country where workers' job rights historically have been quite strong—with that adjustment in the United States. They find that employment in German industries responds much less to changes in demand in the first several months following an upturn or downturn than does employment in the same industries in the United States. However, German employers adjust hours much more in the short run, so that the adjustment of total hours worked is similar in the two countries. Over 12 to 18 months, German employment typically adjusts as much as, and sometimes even more than, U.S. employment. Abraham and Houseman's results suggest that strong worker job security is not necessarily incompatible with employers' needs for flexibility in staffing levels.

Schotter (in joint work with Clive Bull and Keith Weigelt) investigates the impact of equal opportunity laws and affirmative action programs on the behavior of subjects in experimental tournaments. In this work, an equal opportunity law is a change in the rules of a tournament requiring that people with equal performance be treated equally: it prevents discrimination requiring one participant to substantially outperform others in order to win such prizes as promotions or bonuses. Affirmative action programs here require subjects who are cost disadvantaged to be given preferential treatment, so that they may win prizes without outperforming their competitors. Both interventions increase the probability of winning for disadvantaged groups. Equal opportunity laws increase the effort levels of all subjects and the profits of the tournament organizer. Affirmative action programs reduce the effort levels of all subjects



(and the profits of the tournament organizers) when cost disadvantages are not too severe. When the cost disadvantage is large, these programs increase the effort levels of all subjects (and profits), by providing incentives for disadvantaged subjects not to "drop out."

Leonard examines the nature of wage determination and the relative power of market and institutional forces in the electronics industry. Relative to other industries that have been studied, the wages do not vary greatly across firms. The standard deviation of firm wage effects (that is, company wage differentials controlling for occupation) is only 7 percent. Firm effects account for only 3 percent of the variance of wages across occupation, firms, and years. Importantly, these firm effects erode within 5 to 10 years. Firms are not locked into a rigid external wage structure. Their wage behavior may be characterized adequately by simple economic models of homogeneous firms and workers, with transient wage dispersion supported by information or mobility costs. Internal labor market models predict rigid occupational wage differentials within firms, and lower wage variance across firms in entry level positions than in higher level positions. The data for the electronics industry support neither of these predictions, perhaps because most firms are small, there are no unions, and competitive product markets have high rates of technological change and of firm entry and exit.

Ashenfelter and his coauthors study the unique arbitration system used in Iowa for resolving disputes between state and local governments and their employees. Under the Iowa system of tri-offer arbitration, the parties present their cases first to a neutral fact finder who issues a written recommendation. If the fact finder's proposal does not induce the parties to settle their dispute, then they are required to present their best offers to still another neutral arbitrator. The second arbitrator either must select one of these offers or the earlier fact finder's proposal. This paper measures the uncertainty that the parties should expect to face if they are unable to settle a dispute. Then it explores strategies against the predictions of a simple model of optimal offers by risk-neutral bargainers. This model fits the data quite well, which raises questions about why these cases do not reach negotiated settlements.

For all others there is a charge of \$2.00 per reprint to defray the costs of production, postage, and handling. Advance payment is required on orders totaling less than \$10.00. Please do not send cash. Reprints must be requested by number, in writing, from: Reprint Series, National Bureau of Economic Research, 1050 Massachusetts Avenue, Cambridge, MA 02138.

1010. "Understanding the Real Estate Provisions of Tax Reform: Motivation and Impact," by James R. Follain, Patric H. Hendershott, and David C. Ling, 1987 (NBER Working Paper No. 2289)
1011. "The Taxation and Pricing of Agricultural and Industrial Goods in Developing Economies," by Raaj Kumar Sah and Joseph E. Stiglitz, 1987 (NBER Working Paper No. 1338)
1012. "The Recent Decline of Unionization in the United States," by Henry S. Farber, 1987 (NBER Working Paper No. 2267)
1013. "The Optimal Inflation Rate in an Overlapping-Generations Economy with Land," by Bennett T. McCallum, 1987 (NBER Working Paper No. 1892)
1014. "Implicit Taxation in Lottery Finance," by Charles T. Clotfelter and Philip J. Cook, 1987 (NBER Working Paper No. 2246)
1015. "Economic Rents Derived from Hospital Privileges in the Market for Podiatric Services," by Richard G. Frank, Jonathan P. Weiner, Donald M. Steinwachs, and David S. Salkever, 1987 (NBER Working Paper No. 2207)
1016. "Cointegration and Tests of Present-Value Models," by John Y. Campbell and Robert J. Shiller, 1987 (NBER Working Paper No. 1885)
1017. "Capital Gains: Rates, Realizations, and Revenues," by Lawrence B. Lindsey, 1987 (NBER Working Paper No. 1893)
1018. "The Marriage Tax Is Down but Not Out," by Harvey S. Rosen, 1987 (NBER Working Paper No. 2231)
1019. "Are Output Fluctuations Transitory?" by John Y. Campbell and N. Gregory Mankiw, 1987 (NBER Working Paper No. 1916)
1020. "The Relationship between Firm Size and Firm Growth in the U.S. Manufacturing Sector," by Bronwyn H. Hall, 1987 (NBER Working Paper No. 1965)
1021. "Privatization, Information, and Incentives," by David E. M. Sappington and Joseph E. Stiglitz, 1987 (NBER Working Paper No. 2196)
1022. "Our LDC Debts," by Rudiger Dornbusch, 1988 (NBER Working Paper No. 2138)

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1023. "Oligopoly Supergames: Some Empirical Evidence on Prices and Margins," by Ian Domowitz, R. Glenn Hubbard, and Bruce C. Petersen, 1987 (NBER Working Paper No. 2057)
1024. "Money in the Utility Function: An Empirical Implementation," by James M. Poterba and Julio J. Rotemberg, 1987 (NBER Working Paper No. 1796)

## Technical Papers Series

The following studies in the NBER Technical Working Papers series are now available (see previous issues of the *NBER Reporter* for other titles). Like NBER Working Papers, these studies may be obtained by sending \$2.00 per paper to: Technical Working Papers, National Bureau of Economic Research, 1050 Massachusetts Avenue, Cambridge, MA 02138. Prepayment is required for all orders under \$10.00. Please do not send cash.

65. "Asset Pricing with a Factor Arch Covariance Structure: Empirical Estimates for Treasury Bills," by Michael Rothschild and Charles M. Engel, June 1988 (JEL Nos. 313, 212)
66. "The Size and Power of the Variance Ratio Test in Finite Samples: A Monte Carlo Investigation," by Andrew W. Lo and A. Craig MacKinlay, June 1988.

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## Bureau Books

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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.

## Corporate Takeovers

*Corporate Takeovers: Causes and Consequences*, edited by Alan J. Auerbach, reports the results of a two-year NBER study of mergers and acquisitions. It is available from the University of Chicago Press for \$45.00.

Charles C. Brown and James L. Medoff investigate the changes in employment and wages that follow an acquisition. Andrei Shleifer and Lawrence H. Summers question the view that share price increases of firms involved in hostile takeovers reflect efficiency gains from acquisition. Bronwyn H. Hall finds that mergers and acquisitions do not decrease a firm's long-term investment in R and D. Shleifer, Randall Mørck, and Robert Vishny compare the characteristics of firms that are targets of hostile versus friendly takeovers. Richard S. Ruback studies the performance of share prices after a failed takeover attempt. Auerbach and David J. Reishus analyze the effect of the tax system on mergers and acquisitions. Laurie Simon Bagwell and John B. Shoven report on factors motivating shared acquisition programs. Julian R. Franks, Robert S. Harris, and Colin Mayer determine the extent to which acquiring firms use cash, rather than equity. Devra L. Golbe and Lawrence J. White present a historical overview of U.S. mergers and acquisitions. Finally, the implications of recent U.S. policy affecting takeovers are discussed by Joseph A. Grundfest, Greg Jarrell, Steven C. Salop, and Lawrence White.

This volume is more technical than the 1987 *Mergers and Acquisitions*, also edited by Auerbach and published by the University of Chicago Press. Its audience is academic economists, policymakers, and graduate students.

Auerbach is an NBER research associate and a professor of economics at the University of Pennsylvania.

## Issues in U.S.-E.C. Trade Relations

*Issues in U.S.-E.C. Trade Relations*, edited by Robert E. Baldwin, Carl B. Hamilton, and Andre Sapir, is available from the University of Chicago Press for \$49.00. This book contains the papers and discussions presented at a joint conference of the NBER and the Centre for European Policy Studies. Among the topics included are: the legal aspects of trade between the two regions; agricultural policies; the use of embargoes to induce change in political actions; the trend toward protectionism and responses to it; and international trade in services. Most of these issues are discussed from both an American and a European perspective.

This volume is particularly timely and will interest economists and anyone else who wishes to keep abreast of economic developments between the United States and the European Community.

Robert E. Baldwin is an NBER research associate and the Hilldale Professor of Economics at the University of Wisconsin, Madison. Carl B. Hamilton is deputy director for the Institute for International Economic Studies, Stockholm. Andre Sapir is a professor of economics at the Free University of Brussels.

## International Economic Cooperation

*International Economic Cooperation*, edited by Martin Feldstein, is available from the University of Chicago Press. The price is \$50.00 for the clothbound volume and \$17.95 for the paperback. This volume, based on a 1987 NBER conference, includes four non-technical papers by academic economists dealing with macroeconomic policy; exchange rates; international trade; and developing country debt. Personal statements by 15 individuals prominent in business and government, and an introductory essay by the editor, constitute the balance of the volume.

This important work should be of interest not only to policymakers but also to private citizens concerned with the changing role of the United States in an increasingly open world economy.

Martin Feldstein is president and chief executive officer of the National Bureau. He is also the George F. Baker Professor of Economics at Harvard University.

## Unions in the Public Sector

*When Public Sector Workers Unionize*, edited by Richard B. Freeman and Casey Ichniowski, is now available from the University of Chicago Press for \$52.00. This volume contrasts the recent experiences of unions in the public sector with labor-management relations in the private sector. Drawing on newly collected data, the authors explore the evolution, role, and effect of labor laws in the public sector. They also investigate the effects of collective bargaining not only on wages but also on such issues as federal aid to schools, the quality of public education, and levels of employment. Public sector unions, it turns out, have a much smaller effect on wages than unions in the private sector do; but unlike their counterparts in the private sector, they raise employment and reduce layoff rates.

This volume is an important contribution to the literature on unions and should be especially interesting to policymakers. Editor Freeman is the director of the NBER's Program in Labor Studies and a professor of economics at Harvard University. Coeditor Ichniowski is an NBER faculty research fellow and an associate professor at Columbia University's Graduate School of Business.

## Misalignment of Exchange Rates

*Misalignment of Exchange Rates: Effects on Trade and Industry*, edited by Richard C. Marston, is available from the University of Chicago Press at a cost of

\$37.50. This volume investigates the causes of misalignment; its effect on employment and production; whether these effects are reversible; and ways to avoid, or at least limit, misalignment through macroeconomic policy.

William H. Branson attributes the misalignment of the dollar in the 1980s to U.S. federal budget deficits. Charles Bean explains the appreciation of the British pound from 1978-81 by the discovery of North Sea oil, rising prices caused by the Iranian revolution, and adverse factors on the supply side. Paul de Grauwe and Guy Verfaillie show that misalignment is less of a problem for countries in the European Monetary System. Bonnie Loopesko and Robert Johnson analyze how the Japanese economy is adjusting to the recent fall of the dollar. Joshua Aizenman explains how misalignment can result from monetary shocks through wage adjustment. Louka T. Katseli shows how domestic prices respond differently to small changes in exchange rates versus large-scale devaluation or revaluation. J. David Richardson shows that the U.S. auto industry lost competitiveness because of rising unit labor costs even before the dollar began appreciating in the early 1980s. Branson and James P. Love estimate that changes in real exchange rates resulted in a loss of almost a million jobs in U.S. manufacturing from 1980-5. Finally, Paul R. Krugman proposes that the strong dollar may have an irreversible long-term effect on the U.S. economy.

This NBER Project Report should interest policymakers and students of international economics. Its editor, Richard Marston, is an NBER research associate and the James R. F. Guy Professor of Finance and Economics at the Wharton School, University of Pennsylvania.

## Fiscal Federalism

*Fiscal Federalism: Quantitative Studies*, edited by Harvey S. Rosen, is available from the University of Chicago Press for \$39.95. The seven papers in this volume, presented at an NBER conference in 1987, explore the relationships among state, local, and federal governments.

John Joseph Wallis and Wallace F. Oates look at the evolution and extent of decentralization in the state and local sector. Robert P. Inman concentrates on political issues relevant to the growth of federal grants. Jeffrey S. Zax asks how the number and types of government jurisdictions affect local public debt and expenditures. In three separate papers, Rosen and Douglas Holtz-Eakin, Lawrence B. Lindsey, and George R. Zodrow study the effects of deductibility on state and local taxes and expenditures. Finally, Charles R. Hulten and Robert M. Schwab develop estimates of income in the state and local sector.

This volume should be useful to policymakers and to those studying taxation and public finance. Its editor, Rosen, is a research associate of the National Bureau and a professor of economics at Princeton University.

# Current Working Papers

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Individual copies of NBER Working Papers are available free of charge to corporate associates and other supporters of the National Bureau. Others can receive copies of the Working Papers by sending \$2.00 per copy to Working Papers, National Bureau of Economic Research, 1050 Massachusetts Avenue, Cambridge, MA 02138. Please make checks payable to the National Bureau of Economic Research, Inc. Please do not send cash.

*Journal of Economic Literature* (JEL) subject codes, when available, are listed after the date of the Working Paper. Abstracts of all Working Papers issued since March 1988 are presented below. For previous Working Papers, see past issues of the *NBER Reporter*. The 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. Working Papers are not reviewed by the Board of Directors of the NBER.

## Exchange Rate Pass-Through When Market Share Matters

**Kenneth A. Froot and Paul Klemperer**  
Working Paper No. 2542  
March 1988

We investigate pricing to market when the exchange rate changes and the firms' future demands depend on their current market shares. We show that profit-maximizing foreign firms may either raise or lower their domestic currency export prices when the domestic exchange rate appreciates temporarily (that is, the "pass-through" from exchange rate changes to import prices may be perverse). Current import prices may be more sensitive to the expected future exchange rate than to the current exchange rate. Current import prices also fall in response to an increase in uncertainty about the future exchange rate. We show that the behavior of *expected* future exchange rates may provide a clue to the puzzling behavior of U.S. import prices during the 1980s.

## Compositional Effects of Government Spending in a Two-Country, Two-Sector Production Model

**Steven N. Durlauf and Robert W. Stalger**  
Working Paper No. 2543  
March 1988

This paper explores the impact of changes in the composition of government spending on the level of relative prices, interest rates, and the current account. We show that shifting the composition of government spending affects macroeconomic variables according to the relative factor intensities of tradable and nontradable goods. Adjustments of that composition toward nontradables will raise (lower) world interest rates if nontradables are capital (labor) intensive. The announcement of a future shift toward nontradables will induce a current account deficit (surplus) if future interest rates are expected to increase (decrease). The introduction of production thus places restrictions on the comovements of fiscal policy and macroeconomic variables beyond those generated by preferences.

## The Macroeconomics of Exchange Rate and Price Level Interactions: Empirical Evidence for West Germany

**Alberto Giovannini**  
Working Paper No. 2544  
March 1988  
JEL Nos. 023, 130, 134

This paper studies the conditional covariances between the German wholesale price level and the Deutschemark exchange rate in the short run and in the long run. I rely both on an unrestricted time-series model and on a structural Mussa-Dornbusch model. Unrestricted estimates indicate that the volatility of changes in the nominal exchange rate greatly exceed the volatility of the inflation rate, both in the short run and in the long run. This implies a very high correlation between changes in the nominal and real exchange rate. Also, the correlation between the inflation rate and changes in the exchange rate never exceeds 0.4, with 95 percent probability. The structural estimates and sensitivity analysis indicate that there is not perfect price flexibility. The model tends to make sticky prices crucial in explaining the evidence. Since I reject the overidentifying restrictions implied by the structural model, I conclude that we still do not have a fully satisfactory explanation of observed extreme sluggishness of aggregate price levels.

## **Hysteresis in Import Prices: The Beachhead Effect**

**Richard Baldwin**  
Working Paper No. 2545  
March 1988  
JEL No. 431

International economists typically assume that temporary shocks to real exchange rates can have only temporary real effects, and no effect at all on the underlying structure of the economy. This paper shows that even in a simple "off-the-shelf" industrial organization model, this assumption is unfounded: if the costs of market entry are sunk, then exchange rate shocks can alter domestic market structure and thereby have lasting real effects. In other words, a sufficiently large exchange rate shock can cause hysteresis in import prices and quantities. This simple idea has strong implications for exchange rate theory (Baldwin and Krugman [1986] shows this), for trade policy (Dixit [1987] discusses this), and for the estimation of trade equations as this paper shows.

I present evidence that suggests that the recent dollar overvaluation is an example of a hysteresis-inducing shock. I demonstrate that the pass-through relationship shifted in a manner consistent with the nature and timing of changes in the market structure predicted by the model. In particular, the structural break occurred during the rising dollar phase, rather than in 1985 as is commonly asserted.

## **Unemployment Insurance and Unemployment Spells**

**Bruce D. Meyer**  
Working Paper No. 2546  
March 1988  
JEL No. 822

This paper tests the effects of the level and length of unemployment insurance (UI) benefits on the duration of unemployment. In particular, I study individual behavior during the weeks just prior to the end of benefits. Higher UI benefits have a strong negative effect on the probability of leaving unemployment. However, that probability rises dramatically just before the benefit period ends. When the length of benefits is extended, the probability of a spell ending is also very high in the week that the benefits were expected to lapse. The individual data I use have accurate information on spell durations and on the level and length of benefits. I use semiparametric estimation techniques. Comparing them to alternative approaches shows that the semiparametric approach yields more plausible estimates and provides useful diagnostics.

## **Learning in Equilibrium Models of Arbitration**

**Robert S. Gibbons**  
Working Paper No. 2547  
March 1988  
JEL Nos. 832, 026

This paper analyzes strategic communication in equilibrium models of conventional and final-offer interest arbitration. Both models emphasize the arbitrator's role of learning from the parties' offers about the state of the employment relationship; this is initially known to the parties but not to the arbitrator. In both models, the arbitrator's equilibrium behavior is identical to the reduced-form decision rule typically assumed in the empirical literature. The paper thereby provides a structural interpretation for the existing empirical work.

The paper also represents progress toward a complete theory of arbitration because it satisfies three conditions that are required of any such theory. First, the models' predictions match the existing empirical evidence. Second, the models describe equilibrium behavior. Third, the models are built on a common set of assumptions about preferences, information, and commitment. Therefore, the paper not only provides an equilibrium foundation for the intuition that the arbitrator might learn from the parties' offers but also uses the idea of learning to develop a unified analytical treatment of the two major forms of interest arbitration.

## **Workers' Trust Funds and the Logic of Wage Profiles**

**George A. Akerlof and Lawrence F. Katz**  
Working Paper No. 2548  
March 1988  
JEL Nos. 821, 026

This paper defines a workers' trust fund, a concept that is useful in analyzing optimal age-earnings profiles. The trust fund represents what a worker loses if dismissed from a job for shirking. In considering whether to work or shirk, a worker weighs the potential loss through forfeiture of the trust fund if caught shirking against the benefits from reduced effort. This concept shows that the implicit bonding in upward-sloping age-earnings profiles is not a perfect substitute for an explicit up-front performance bond (or employment fee). It also shows that the second-best optimal earnings profile, in the absence of and up-front employment fee, pays total compensation in excess of market clearing in a variety of stylized cases.

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**The Contribution of *A Monetary History of the United States: 1867 to 1960* to Monetary History**

**Michael D. Bordo**  
Working Paper No. 2549  
April 1988  
JEL Nos. 042, 311, 432

This paper assesses the role of *A Monetary History of the United States: 1867 to 1960* by Friedman and Schwartz as a progenitor of research in monetary history. It critically surveys the literature on three major themes in the book: monetary disturbances; the domestic monetary framework and monetary policy; and monetary standards.

The book's unique portrayal of the historical circumstances of monetary disturbances and of alternative institutional arrangements serves as the closest thing to a laboratory experiment for the monetary economist. Historical study has become an important tool of modern macroeconomic research.

**Strikes and Wages:  
A Test of a Signaling Model**

**David Card**  
Working Paper No. 2550  
April 1988  
JEL No. 830

This paper describes a simple model of labor disputes based on the hypothesis that unions use strikes to infer the level of profitability of the firm. It then tests the implications of the model using data on wage outcomes, strike probabilities, and strike durations for a large sample of collective bargaining agreements. Negotiated wages depend negatively on regional unemployment rates and positively on industry-specific selling prices. However, contrary to the basic premise of the model, there is no systematic relationship between wages and strike outcomes. Increases in unemployment decrease the probability of strikes, while increases in industry selling prices increase the probability of disputes. Strike durations are only weakly related to unemployment and industry prices but are negatively correlated with industry output.

**Lessons on Monetary Policy from the 1980s**

**Benjamin M. Friedman**  
Working Paper No. 2551  
April 1988

Monetary policy events in the United States during the 1980s have led to important changes in thinking about monetary policy and in the actual conduct of that policy. The central event in this regard has been the collapse of relationships connecting familiar money to both income and prices. The *fastest* money growth since World War II, maintained for fully half a decade, occurred in conjunction with the greatest postwar *reduction* in inflation. Inflation predictions based on money growth during this period therefore failed altogether to anticipate what many observers have regarded as the most significant monetary policy success of the postwar period. Predictions based on credit aggregates would have fared no better.

Other important changes have resulted from the increased openness of the U.S. economy and the U.S. financial markets. International considerations that previously could have mattered in a policy context, but typically did not, have reached macroeconomically meaningful magnitudes in the 1980s. The sharp decline in U.S. competitiveness, following the rise in dollar exchange rates early in the decade, powerfully affected U.S. nonfinancial economic activity. The borrowing that the United States has done to finance the resulting trade deficit has greatly enhanced the role of foreign investors in U.S. markets. Exchange rates therefore have assumed new importance in the conduct of U.S. monetary policy.

Along with exchange rates, short-term interest rates again have emerged as the principal focus of policy. Economic research probably would prove more useful in a policy context if economists turned at least some of the efforts they have devoted to trying to resurrect money-income and money-price relationships to analyzing how to conduct monetary policy without them.

**Monetary Policy without Quantity Variables**

**Benjamin M. Friedman**  
Working Paper No. 2552  
April 1988  
JEL Nos. 310, 311

The 1980s collapse of familiar relationships connecting money to either income or prices has thrown into question long-standing presumptions about the appropriate conduct of monetary policy. Once data from the 1980s are included, tests of several kinds—including

ing simple regression tests, vector autoregressions tests, and tests for cointegration—all fail to show evidence of properties that would support using money as the central fulcrum of monetary policy. The Federal Reserve System, whether in response to these developments or for independent reasons, appears to have refocused monetary policy onto movements of short-term interest rates. The experience of the 1950s and 1960s suggests that this alternative approach also suffers from potentially serious drawbacks, which little recent research has addressed.

## **The Tax Reform Act of 1986 and Economic Growth**

**Patric H. Hendershott**  
Working Paper No. 2553  
April 1988  
JEL No. 323

Early tax reform proposals listed economic growth as a major goal. Some even explicitly estimated the expected increase in the long-run path of output that would follow from enactment. The 1986 Tax Act does not mention growth, much less estimate the expected increase, for good reason. The 1986 Tax Act likely will reduce the long-run path of output by 2 to 4 percent.

A revenue-neutral tax reform that raises the standard deduction and personal exemption in general cannot increase the bundle of goods one can purchase with an additional hour worked. Cuts in marginal personal tax rates can be achieved by broadening the tax base and shifting the tax burden to businesses. However, while the aftertax wage will increase, so will the aftertax cost of goods consumed, both currently and in the future. Thus, work effort is unlikely to rise. Similarly, a tax reform that shifts the tax burden from labor and existing capital to new investments likely will lower saving and reallocate capital away from industrial uses. While the Tax Act will increase the efficiency of business investment, the potential efficiency gains are so small that actual gains will be swamped by the direct effect of a smaller stock of business capital.

## **Interindustry R and D Spillovers, Rates of Return, and Production in High Tech Industries**

**Jeffrey I. Bernstein and M. Ishaq Nadiri**  
Working Paper No. 2554  
April 1988

This paper estimates the effects of interindustry R and D spillovers on productivity and factor bias for five

high tech industries. Each industry is distinguished as a separate spillover source. The industries each are affected by R and D spillovers and are themselves sources of spillovers. Thus, we estimate a spillover network among the industries.

We also calculate private and social rates of return to R and D capital. The private rates of return generally are greater than the returns to physical capital are. In addition, the social rates of return are greater than the private rates are. The results show that there are significant differences between industries as to their importance as sources of R and D spillovers.

## **Resolving Debt Crises: A Historical Perspective**

**Barry J. Elchengreen**  
Working Paper No. 2555  
April 1988  
JEL Nos. 400, 433

Two general approaches have been offered for dealing with the developing country debt crisis: continued reliance on case-by-case negotiation; and global plans for fundamentally restructuring the terms of international lending and repayment. Both approaches have precedents in earlier historical periods. In the 1930s, for instance, when some two-thirds of foreign dollar bonds lapsed into default, several global schemes for resolving the crisis were considered even while individual debtor-creditor negotiations were underway. In the end, no global plan was adopted and the debt crisis of the 1930s was resolved by the "muddling-through" approach of case-by-case negotiation. This experience suggests two questions about the efficacy of the alternative approaches. First, what stumbling blocks stand in the way of the adoption of global schemes? Second, as a crisis drags on, how do the evolution of debtor and creditor strategies permit it to be resolved through bilateral negotiation? In this paper, historical evidence from the interwar period is used to address these questions.

## **A Structural Equation Model for Tax Compliance and Auditing**

**Kurt Beron, Helen V. Tauchen, and Ann Dryden Witte**  
Working Paper No. 2556  
April 1988

In this paper, we estimate a three-equation model for taxpayers' reported income and tax liability and for the

probability of an audit. Our work differs from previous studies in that our dependent variables in the compliance equations are taxpayer reports rather than a variable related to auditor estimates of noncompliance. We also estimate a structural equation for audits.

We find that audits stimulate compliance, although the effect is not large and is not statistically significant for all groups. Audits are more effective at inducing accurate reporting of subtractions from income than of income. Reduced-form results suggest that IRS activities other than audits have significant compliance effects.

Results for the sociodemographic variables are interesting and help to explain some seemingly incongruous findings in the literature. We find compliance to be higher, if anything, in areas with less educated and older taxpayers, a large proportion of households headed by females, and a mostly native-born population.

## **On the Difference between Tax and Spending Policies in Models with Finite Horizons**

**William H. Branson and Giampaolo Galli**  
Working Paper No. 2557  
April 1988  
JEL Nos. 300, 320, 321

This paper uses the Blanchard (1985) finite-horizon model to study how taxes and government spending can be managed to stabilize aggregate demand. We show that tax policy cannot stabilize demand faster than it stabilizes the public debt; but if government spending is the instrument of policy, then demand can be stabilized independently of the dynamics of the debt. If the objective is to stabilize the debt while maintaining demand as close to a predetermined target path as possible, and if taxes are the instrument, then taxes would have to be changed temporarily *as much as is feasible*. On the other hand, if the instrument is government spending, it can be changed *gradually* to achieve the objectives.

The dynamic effects of taxes are a straightforward implication of the intertemporal budget constraint, when it is assumed that agents cannot be surprised by government policies. More traditional dynamics can be obtained if it is assumed that the government succeeds in announcing a policy and implementing a different one. However, if the announcement is not credible, then discretion is inferior to a predetermined tax rate.

## **Costs of Financial Distress, Delayed Calls of Convertible Bonds, and the Role of Investment Banks**

**Andrei Shleifer and Dwight Jaffee**  
Working Paper No. 2558  
April 1988  
JEL Nos. 314, 521

In a frictionless market with imperfect information, a firm that maximizes shareholder wealth should force conversion of its convertible bond issue into stock as soon as the bond comes in the money. However, firms appear to systematically delay forced conversion, sometimes for years beyond this time. We show that the observed delays can be explained plausibly in terms of costs to shareholders of a failed conversion and the ensuing financial distress. Firms delay the forced conversion to avoid the self-fulfilling outcome that bondholders expect the conversion to fail; they tender their bonds for cash, and the stock price falls to account for the costs of financial distress. In this case, tendering for cash in fact is optimal. Unlike other explanations of delayed forced conversion, ours explains the common use of investment banks to underwrite these transactions, since the banks can eliminate the self-fulfilling bad outcome.

## **Financial Structure and Aggregate Economic Activity: An Overview**

**Mark Gertler**  
Working Paper No. 2559  
April 1988  
JEL Nos. 300, 023, 130

This paper surveys the literature on the possible links between the financial system and aggregate behavior. In the first part, I review the traditional work; in the second part, I discuss new research.

## **Labor Market Institutions, Constraints, and Performance**

**Richard B. Freeman**  
Working Paper No. 2560  
April 1988

This study examines the changes in labor market institutions and outcomes across OECD countries in the past two decades and relates indicators of the institutions to outcomes. It has four findings. First, there



has been an increased divergence in labor market institutions, with unionization growing or remaining at high levels of density in some countries and declining in others. Second, changes in the two major outcomes on which analysts and policymakers focus—employment and real wages—are substantially negatively correlated across countries, conditional on growth of GDP. Countries that had rapid growth of employment in the 1970s or 1980s, and high rates of employment-to-working-age population, such as the United States or Sweden, had relatively slow growth of real wages. By contrast, countries with relatively slow growth of employment, such as Spain, had rapid growth of real wages, indicative of a labor demand type of constraint on outcomes. Third, there is a moderate nonlinear relationship between labor market outcomes and institutions. Employment in countries with either relatively centralized wage-setting (as evidenced by little interindustry dispersion of wages), such as the Scandinavian countries, and countries with decentralized wage-setting (as indicated by high interindustry dispersion of wages) performed better than countries with intermediate types of labor market structures and institutions did. Fourth, even among countries with comparable institutions, there is a considerable diversity of performance.

### **Job Queues and Wages: New Evidence on the Minimum Wage and Interindustry Wage Structure**

**Harry J. Holzer, Lawrence F. Katz, and Alan B. Krueger**

Working Paper No. 2561

April 1988

JEL Nos. 820, 824

This paper uses data on job applications to test the existence of noncompetitive, *ex ante* rents in the labor market. First we ask whether jobs that pay the legal minimum wage face an excessive supply of labor as measured by the number of job applications received for the most recent position filled by the firm. The results indicate that jobs paying the minimum wage attract significantly more applications than jobs that pay either more or less than the minimum wage do. This spike in the distribution of job application rates indicates that *ex ante* rents generated for employees by an above-market-level minimum wage do not appear to be completely dissipated by employer actions.

The second part of the paper uses a similar approach to examine whether jobs in high-wage industries pay wage rates above market clearing. We find a weak, positive relationship between interindustry application differentials and interindustry wage differentials. In addition, employer size has a sizable positive effect on the job application rate, even after controlling for the wage rate. The paper considers several possible explanations for these findings.

### **Evaluating the European View That the United States Has No Unemployment Problem**

**Richard B. Freeman**

Working Paper No. 2562

April 1988

This study contrasts the labor market performance of the United States and OECD Europe in the 1980s. It critically evaluates the view that the United States has generated more jobs because its labor market is more flexible. The greater expansion of employment in the United States was associated with slower growth of real wages and productivity than in most of OECD Europe, not with relatively costless flexibility. While some aspects of relative wage flexibility (for instance, in youth versus adult wages) showed no greater flexibility in the United States than in the United Kingdom, where labor markets allegedly are less flexible. Finally, the disparate experiences of the United Kingdom, with a relatively decentralized labor market, and Sweden, with a centralized wage-setting system, show that decentralized labor markets are neither necessary nor sufficient for employment-enhancing wage settlements.

### **The Impact of New Unionization on Wages and Working Conditions: A Longitudinal Study of Establishments under NLRB Elections**

**Richard B. Freeman and Morris M. Kleiner**

Working Paper No. 2563

April 1988

This study investigates the impact of union organization on the wages and labor practices of establishments that were organized in the 1980s. We use a research design in which establishments are paired with their closest nonunion competitor. We find first that unionism had only a modest effect on wages in the newly organized plants. This contrasts sharply with the huge union wage impact found in cross-section comparison of union and nonunion individuals in the Current Population Survey and related data tapes. Second, despite its modest impact on wages, new unionization substantially altered several personnel practices: it led to grievance systems, greater seniority protection, and job bidding and posting. Since newly organized establishments adopt working conditions but grant only modest increases in wages, the key to understanding what unionism does in the economy may be collective voice rather than monopoly wage gains.

## **Is There a Regional Bias in Federal Tax Subsidy Rates for Giving?**

**Charles T. Clotfelter and Daniel R. Feenberg**

Working Paper No. 2564

April 1988

This study examines regional variation in average subsidy rates for charitable donations. Because the tax incentive for contributions is embodied in an itemized deduction, the subsidy rate for an individual depends on itemization status and marginal tax rate. It is well known that this subsidy rate rises with income.

On a regional level, one would expect that subsidy rates would be higher in wealthier regions. What is not clear is the extent of such variation, or whether subsidy rates vary systematically, independent of income. In order to examine the sources of variation, we decompose subsidy rates. We find significant variation in subsidy rates independent of income. There appears to be an unintended regional bias in the federal policy toward charitable giving. If most contributions remain in the state or region of the donor, this bias tends to affect the regional development of the nonprofit sector.

## **Real Exchange Rate Variability under Pegged and Floating Nominal Exchange Rate Systems: An Equilibrium Theory**

**Alan C. Stockman**

Working Paper No. 2565

April 1988

JEL No. 430

This paper proposes a new explanation for the greater variability of real exchange rates under pegged than under floating nominal exchange rate systems. The explanation hinges on the propensity of governments to use international trade restrictions and financial restrictions for balance-of-payments purposes under pegged exchange rates. In particular, these restrictions become more likely during periods when countries suffer losses of international reserves that might, without policy changes, lead to a balance-of-payments crisis. This covariation of restrictions with reserve changes implies that real exchange rates will vary less under pegged than under floating exchange rates.

## **Immigration and Self-Selection**

**George J. Borjas**

Working Paper No. 2566

April 1988

JEL No. 800

Self-selection predominantly determines the size and composition of immigrant flows. The United States competes with other potential host countries in the "immigration market"; these host countries vary in their "offers" of economic opportunities and in the way they ration entry through their immigration policies. Potential immigrants compare the various opportunities and are nonrandomly sorted by the immigration market among the various host countries.

This paper presents a theoretical and empirical analysis of the immigration marketplace. It describes how immigrants are sorted among host countries in terms of both their observed and their unobserved characteristics. I use Census data from Australia, Canada, and the United States to show that U.S. "competitiveness" in the immigration market has declined significantly in the postwar period.

## **Inflation and Taxation with Optimizing Governments**

**James M. Poterba and Julio J. Rotemberg**

Working Paper No. 2567

April 1988

JEL No. 311

This paper extends and evaluates previous work on the positive theory of inflation. We examine the behavior of governments concerned solely with minimizing the deadweight loss from raising revenue through inflation and tax finance. We show that both governments that can commit to future policy actions and those that cannot precommit will choose a positive contemporaneous association between inflation and the level of tax burdens. Using data from Britain, France, Germany, Japan, and the United States, we find that inflation and tax rates are as likely to be negatively correlated as positively correlated. The results cast doubt on the empirical relevance of simple models in which governments with time-invariant tastes choose monetary policy to equate the marginal deadweight burdens of inflation and taxes.

## **Interpreting Cointegrated Models**

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

Working Paper No. 2568

April 1988

JEL No. 313

Error-correction models for cointegrated economic variables commonly are interpreted as reflecting partial adjustment of one variable to another. We show that such models also may arise when one variable forecasts another. Reduced-form estimates of error-correction models cannot be used to distinguish these interpretations. We show that the estimated coefficients in the Marsh-Merton (1987) error-correction model of dividend behavior in the stock market are implied roughly by a near-rational expectations model with persistent dividends and prices disturbed by some persistent random noise. The Marsh-Merton results thus do not demonstrate partial adjustment or "smoothing" by managers; they may reflect little more than the persistence of dividends and the noisiness of prices.

## **Pricing Physical Assets Internationally**

**Bernard Dumas**

Working Paper No. 2569

April 1988

Transferring physical capital and production and sales activities from one country to another typically entails large adjustment costs. In this paper, there are two homogeneous stocks of physical capital located in two different countries separated by an "ocean." The two physical stocks are invested optimally in a random production process that yields real returns that are consumed by local residents or transferred abroad. Retrofitting, transferring, and rebuilding capital equipment and increasing production and sales abroad, either take time (during which capital is idle) or consume real resources. As a result, the price of capital-consumption goods located in one place is not equal to the price of goods located in the other place. I obtain the stochastic process for this deviation from the Law of One Price (LOP). This process is compatible with financial market efficiency and with the possibility of (costly) trade in commodities. Whereas empirical studies have found no evidence against the hypothesis that LOP deviations follow a martingale, my theoretical process exhibits mean reversion (as well as a fair degree of conditional heteroskedasticity) when investors are risk averse.

## **Rates of Return on Physical and R and D Capital and Structure of the Production Process: Cross-Section and Time-Series Evidence**

**Jeffrey I. Bernstein and M. Ishaq Nadiri**

Working Paper No. 2570

April 1988

JEL No. 621

Investment in R and D is an outcome of a corporate plan. It is influenced by the existing technology, prices, characteristics of product demand, and the legacy of past decisions on the capital stock. This paper focuses on the determinants and interaction of labor, physical capital, and R and D.

In particular, we investigate three issues. First is the nature of the factor substitution possibilities among the three inputs in response to changes in their prices. We estimate the own and cross-price elasticities of the factors of production. The second problem pertains to the magnitude by which output expansion (or what may be considered the same thing: product demand growth) increases labor, physical, and R and D capital. Finally, we address the extent to which adjustment costs affect factor demands and measure the magnitude of these costs for physical and R and D capital.

## **Investment, Depreciation, and Capital Utilization**

**Jeffrey I. Bernstein and M. Ishaq Nadiri**

Working Paper No. 2571

April 1988

JEL No. 522

This paper analyzes the determinants of capital durability and utilization and their interdependence with investment decisions. We base the approach on the view that the flow of undepreciated capital is an output to be used in future production. At each date, we combine capital and noncapital inputs to produce current output and the capital inputs to be used for future production. Thus, capital accumulation occurs in a joint product context as two kinds of output are produced: one for current sale and one for future production.

Another issue in this paper is the allocation of resources within a firm between installing and utilizing capital and labor training activities. Often this problem is ignored in the theory of investment, not only because depreciation is exogenous but also because it is treated as a variable factor of production. However, it is well recognized that firms cannot adjust labor costlessly. Thus, the second purpose of this paper is to analyze the intertemporal relationship between the durability of capital and the growth rate of labor.

## **Labor Demand and the Structure of Adjustment Costs**

**Daniel S. Hamermesh**  
Working Paper No. 2572  
May 1988  
JEL Nos. 824, 022

This paper examines the costs that firms face in adjusting labor demand to shocks induced by changes in output demand and prices. Using monthly, plant-level, time-series data, I show that adjustment proceeds in jumps: employment does not change in response to small demand shocks but, if the shocks are large, it moves instantaneously to a new long-run equilibrium. Results in the literature that assumes smooth adjustment are caused by aggregation of this inherently nonlinear relationship over subunits experiencing different shocks. My finding has implications for cyclical changes in productivity and for examining the effects of policies such as severance pay, layoff and restrictions on plant closings, and mandatory listing of job vacancies, all of which change the cost of adjusting employment.

## **The Time Variation of Risk and Return in the Foreign Exchange and Stock Markets**

**Albert Giovannini and Philippe Jorlan**  
Working Paper No. 2573  
May 1988  
JEL Nos. 430, 433, 520, 213

Recent empirical work indicates that, in a variety of financial markets, both conditional expectations and conditional variances of returns vary over time. This paper asks whether these joint fluctuations of conditional first and second moments are consistent with the Sharpe-Lintner-Mossin capital asset pricing model (CAPM). We test the mean-variance model under several different assumptions about the time variation of conditional second moments of returns; we use weekly data from July 1974 to December 1986 that include returns on a portfolio of dollar, Deutschmark, sterling, and Swiss franc assets, and the U.S. stock market. We constrain risk premiums to depend on the time-varying conditional covariance matrix of the residuals of the expected returns equations.

The results indicate that estimated conditional variances cannot explain the observed variation of risk premiums over time. Furthermore, the constraints imposed by the static CAPM always are rejected.

## **Bubbles, Fads, and Stock Price Volatility Tests: A Partial Evaluation**

**Kenneth D. West**  
Working Paper No. 2574  
May 1988  
JEL No. 521

This paper is a summary and interpretation of some of the literature on stock price volatility that was simulated by Leroy and Porter, and by Shiller (both 1981). It appears that neither small sample bias, rational bubbles, nor some standard models for expected returns, adequately explain stock price volatility. This suggests a role for some nonstandard models for expected returns. One possibility is "fads" models in which noise trading by naive investors is important. At present, however, there is little direct evidence that such fads play a significant role in the determination of stock prices.

## **The Information in the Term Structure: Some Further Results**

**Frederic S. Mishkin**  
Working Paper No. 2575  
May 1988  
JEL Nos. 130, 310

This paper provides some refinements and updates Fama's (1984) evidence on the information in the term structure about future spot interest rate movements. First, it uses econometric techniques that properly correct standard errors for overlapping data and for conditional heteroskedasticity. Second, it uses a new dataset that has some potential advantages over Fama's and has more recent data. Overall, the results broadly agree with those of Fama. The term structure does help to predict spot interest rate movements several months into the future. Indeed, updating Fama's results indicates that the forecast power of forward rates is generally higher from October 1982 to June 1986 than it was during the sample periods Fama examined.

## **A Noncompetitive, Equilibrium Model of Fluctuations**

**Robert E. Hall**  
Working Paper No. 2576  
May 1988  
JEL No. 131

An equilibrium model of fluctuations has two components: an elastic labor supply schedule; and a source

of shifts of the labor demand schedule. In the real business cycle model, shifts of labor demand follow from vibrations in the production function. In this paper, shifts of labor demand are the result of changes in preferences. Total real GNP falls when demand shifts away from goods produced by sectors with market power and toward competitive sectors. The observed cyclical stability of relative prices is consistent with such demand shifts.

### **On the Consistency of Short-Run and Long-Run Exchange Rate Expectations**

**Kenneth A. Froot and Takatoshi Ito**

Working Paper No. 2577

May 1988

This paper asks whether short-term exchange rate expectations move "too much" by comparing them with long-term expectations. We develop a set of non-linear restrictions linking expectations at different forecast horizons. The restrictions impose *consistency*, a property weaker than rationality. We use exchange rate survey data to measure expectations and then test whether consistency holds. The data show that a current, positive exchange rate shock leads agents to expect a higher long-run future spot rate when iterating forward their short-term expectations than when thinking directly about the long run. In this sense, short-horizon expectations may overreact to current exchange rate changes.

### **Debt Neutrality, Redistribution, and Consumer Heterogeneity: A Survey and Some Extensions**

**Willem H. Buiter**

Working Paper No. 2578

May 1988

JEL Nos. 130, 321

For an economic system not to exhibit debt neutrality, changes in the time profile of lump-sum taxes must redistribute resources among heterogeneous consumers. Unless a bequest motive or a child-to-parent gift motive is operative, a positive birth rate is sufficient for absence of debt neutrality, with or without efficient life insurance markets. Heterogeneous survival probabilities are a sufficient condition. Heterogeneous time preference rates, or elasticities of marginal utility, do not destroy debt neutrality; with common survival rates, changes in the pattern over time of lump-sum taxes do not redistribute resources. Any representative agent model, regardless of the scope and severity of capital market imperfections, will exhibit debt neutrality.

### **Corporate Taxes and Incentives and the Structure of Production: A Selected Survey**

**Jeffrey I. Bernstein and M. Ishaq Nadiri**

Working Paper No. 2579

May 1988

JEL Nos. 226, 323

In this paper we develop a general intertemporal model of production, emphasizing the role of present and expected future corporate income taxes, credits, and allowances, along with costly adjustment and variable utilization of the quasifixed factors. We consider three specific issues: 1) the direct and indirect effects of taxes operating through factor prices on the long-run input substitution, thus altering the structure of the production process; 2) the effects of tax policy changes on the rate and direction of technological change; and 3) the effects of tax policy on the intertemporal pattern of substitutions and complementarities among the inputs that arise because of quasifixity of some inputs. The rates of utilization of the quasifixed factors are determined in the short run in conjunction with the demands for the variable factors of production. Hence, utilization rates depend on product and factor prices and therefore on tax policy. We specialize the general model in order to highlight each of the three themes and their interaction with tax policy.

### **Consumption and Investment**

**Andrew B. Abel**

Working Paper No. 2580

May 1988

JEL No. 023

This paper presents an overview of current models of consumption and investment. First, I discuss the stochastic implications of the permanent-income model and the empirical tests of these implications. Then I extend the simple theoretical model to include expenditure on consumer durables. In addition, I discuss the implications of liquidity constraints and the unpredictability of the rate of return on wealth and conclude the overview of consumption behavior with a critical discussion of the Ricardian Equivalence Theorem.

I analyze investment behavior using a dynamic optimization model of a firm facing costs of adjustment. This framework integrates the accelerator model, the neoclassical model, and the  $q$  theory. I then use the model to analyze the interaction of corporate taxes, inflation, and investment and also to analyze the effects of uncertainty on investment. I conclude the overview of investment with a discussion of inventory.

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## **Interest Rate Smoothing**

**Robert J. Barro**

Working Paper No. 2581

May 1988

JEL No. 310

This paper develops a model in which targeting the nominal interest rate is a reasonable guide for monetary policy. Expected real interest rates and output are exogenous with respect to monetary variables, and the central bank influences nominal interest rates by altering expected inflation. In this model, the monetary authority can come arbitrarily close in each period to its (time-varying) target for the nominal interest rate, even while holding down the forecast variance of the price level. The latter objective pins down the extent of monetary accommodation to shifts in the demand for money and other shocks, and thereby makes the levels of money and prices at each date determinate. Empirical evidence for the United States in the post-World War II period suggests that the model's predictions accord reasonably well with observed behavior for nominal interest rates, growth rates of the monetary base, and rates of inflation. Earlier periods, especially before World War I, provide an interesting contrast because smoothing of interest rates did not apply. The behavior of the monetary base and the price level at these times differed from the post-World War II experience as predicted by the theory.

## **Endogenous Participation In Agricultural Support Programs and Ad Valorem Equivalent Modeling**

**John Whalley and Randall M. Wigle**

Working Paper No. 2583

May 1988

This paper argues that a price wedge treatment of agricultural supports can misrepresent their welfare and quantity effects seriously. We make our point by focusing on pre-1985 U.S. wheat programs, but features of programs in many other countries lead to comparable problems with the ad valorem approach. This line of argument raises questions over the current approach (in the multilateral trade negotiations) of negotiating on producer subsidy equivalents or some other measure similar to a subsidy.

## **The Role of Export Subsidies When Product Quality Is Unknown**

**Robert W. Staiger and Kyle Bagwell**

Working Paper No. 2584

May 1988

We explore the role of export subsidies when goods arriving from foreign countries are initially of unknown quality to domestic consumers, who learn about their quality only through consumption. When confronted with such goods, if consumers view price as a signal of quality, then a role for export subsidies can arise. In particular, we show that, absent export subsidies, entry of high-quality firms may be blocked by their inability to sell at prices reflecting their true quality. Export subsidies enable high-quality producers to begin exporting profitably even while they are unable to convey their high quality to consumers credibly in the "introductory" period. Thus, in breaking the entry barrier for high-quality firms, export subsidies can raise average quality in the market; a welfare-improving role for export subsidies emerges. Moreover, even when firms find it possible to signal their high quality to consumers through an introductory pricing strategy, a role for government policy can arise: the signal (low introductory price) represents a transfer of surplus from foreign producers to domestic consumers that can be avoided with an appropriate export tax/subsidy policy.

## **Debt and Conditionality under Endogenous Terms-of-Trade Adjustment**

**Joshua Aizenman and Eduardo R. Borensztein**

Working Paper No. 2582

May 1988

This paper identifies conditions under which renewed lending will benefit both the developed and the developing countries. Our analysis evaluates how the presence of terms-of-trade adjustment and distorted credit markets affect the conditions regarding the existence of beneficial lending. We demonstrate that in the presence of endogenous terms-of-trade adjustment, there are cases in which a competitive international banking system may not revitalize lending for investment purposes, even if such renewed lending is socially desirable. Renewed lending may require the appropriate conditionality, and the presence of endogenous terms-of-trade adjustment puts greater weight on investment conditionality.

## **U.S. Inflation, Labor's Share, and the Natural Rate of Unemployment**

**Robert J. Gordon**

Working Paper No. 2585

May 1988

JEL No. 311

The Phillips curve initially was formulated as a relationship between the rate of *wage* change and unemployment. Yet what matters for stabilization policy is the rate of inflation, not the rate of wage change. This paper provides new estimates of Phillips curves for both prices and wages, from 1954–87 and for several subperiods.

The most striking result in the paper is that wage changes do not contribute statistically to the explanation of inflation. Deviations in the growth of labor costs from the path of inflation cause changes in labor's share of income, and changes in the profit share in the opposite direction, but they do not feed back to the inflation rate. I also find that the natural unemployment rate for the United States is still 6 percent; there was no decline in the 1980s in response to the reversal of the demographic shifts that had raised the natural rate in the 1960s and 1970s. The U.S. inflation process is stable, with no evidence of structural shifts over 1954–87. But the wage process is not stable: low rates of wage change in 1981–7 cannot be predicted accurately by wage equations estimated through 1980. Rather than representing a "new regime," wage behavior in the 1980s is the outcome of a longer-term process. The 1980s have witnessed a substantial decline in labor's income share that partly reverses the even larger increase in labor's share that occurred between 1965 and 1978.

## **Deindustrialization, Reindustrialization, and the Real Exchange Rate**

**Paul R. Krugman**

Working Paper No. 2586

May 1988

JEL No. 431

This paper models an economy in which it is costly to move resources between the tradable and nontradable sectors. The economy is subject to capital flows that are unpredictable and are perceived as having only limited persistence. The model shows that the fact that capital flows are perceived as temporary, together with uncertainty per se, act to limit the responsiveness of resource allocation to real exchange rate

movements. In turn, this reluctance of factors to move widens the range of real exchange rate variation, so that larger movements of the real exchange rate are needed to accommodate transitory, unpredictable capital flows than would be required to accommodate persistent, predictable flows of the same magnitude. The model also shows that large capital inflows, which lead to real exchange rate appreciation large enough to induce resource allocation, typically will be followed by a depreciation of the real exchange rate to below its original level.

## **Market-Based Debt-Reduction Schemes**

**Paul R. Krugman**

Working Paper No. 2587

May 1988

JEL No. 433

The idea of reducing the debt of developing countries through a "menu approach" of schemes that attempt to harness the discounts on debt in the secondary market has been discussed recently. After reviewing the rationale for the orthodox strategy of concerted lending and the case for debt forgiveness, this paper examines the logic behind several market-based debt-reduction schemes. It shows that such schemes ordinarily will benefit both debtor and creditor only when the debtor is on the wrong side of the "debt-relief Laffer curve"—that is, where a reduction in nominal claims actually increases expected payment. However, this is also true when unilateral debt forgiveness is in the interest of creditors in any case. The implication is that there is no magic in market-based debt reduction, as opposed to more straightforward approaches.

## **Government Spending in a Simple Model of Endogenous Growth**

**Robert J. Barro**

Working Paper No. 2588

May 1988

JEL Nos. 111, 320, 023

I extend existing models of endogenous economic growth to incorporate a government sector. Production involves private capital (broadly defined) and public services. There are constant returns to scale in the



two factors, but diminishing returns to each separately. Public services are financed by a flat-rate income tax. The economy's growth rate and saving rate initially rise with the ratio of productive government expenditures to GNP ( $g/y$ ), but eventually each rate reaches a peak and subsequently declines. If the production function is Cobb–Douglas with an exponent  $\alpha$  for public services, then the value  $g/y = \alpha$  maximizes the utility attained by the representative consumer.

The distortion from the income tax implies that the decentralized equilibrium is not Pareto optimal; in particular, the growth and saving rates are too low from a social perspective. In a command optimum, growth and saving rates are higher, but  $g/y = \alpha$  still turns out to be the best choice for the size of government. The command optimum can be sustained by picking the expenditure ratio,  $g/y = \alpha$ , and then financing this spending by lump-sum taxes. If the share of productive spending,  $g/y$ , were chosen randomly, then the model would predict a nonmonotonic relationship between  $g/y$  and the economy's long-term growth and saving rates. However, for optimizing governments, the model predicts an inverse association between  $g/y$  and the rates of growth and saving.

## **Sources of Business Cycle Fluctuations**

**Matthew D. Shapiro and Mark W. Watson**

Working Paper No. 2589

May 1988

JEL Nos. 131, 111, 211

What shocks account for the frequency of business cycles and the long-run movements of output and prices? We address this question using the identifying assumption that only supply shocks, such as shocks to technology, oil prices, and labor supply, affect output in the long run. Real and monetary shocks to aggregate demand can affect output, but only in the short run. This assumption sufficiently restricts the reduced form of key macroeconomic variables to allow estimation of the shocks and their effect on output and price at all frequencies. Aggregate demand shocks account for about 20 to 30 percent of output fluctuations at business cycle frequencies. Technological shocks account for about 25 percent of cyclical fluctuations, and about one-third of the variance of output at low frequencies. Shocks to oil prices are important in explaining episodes in the 1970s and 1980s. Shocks that affect labor input permanently account for the balance of fluctuations in output; that is, about half of its variance at all frequencies.

## **Relative Wages, Efficiency Wages, and Keynesian Unemployment**

**Lawrence H. Summers**

Working Paper No. 2590

May 1988

JEL Nos. 130, 824

While modern economic theorists have produced a variety of explanations for the failure of wages to fall in the face of unemployment, most have not discussed Keynes's emphasis on relative wages. This short paper suggests that relative wage theories, in which workers' productivity depends primarily on their relative wage, provide the best available apparatus for understanding actual unemployment and its fluctuations. Such theories are very closely related to the efficiency wage theories that have received widespread attention in recent years.

## **Labor Hoarding, Inflexible Prices, and Procyclical Productivity**

**Julio J. Rotemberg and Lawrence H. Summers**

Working Paper No. 2591

May 1988

JEL No. 130

We show that, even with perfect competition, a small amount of price rigidity makes the extent of procyclical productivity depend mainly on the extent of labor hoarding. (We assume that firms must set their prices somewhat before the level of demand becomes known.) Indeed, whether productivity is measured via the Solow method (using labor's share in revenues) or by other methods, it tends to be more procyclical in industries and nations where labor hoarding is more important.

## **Growth, Technological Progress, and Trade**

**Elhanan Helpman**

Working Paper No. 2592

May 1988

JEL Nos. 110, 410

This paper reviews and interprets recent developments in the theory of economic growth and dynamic trade theory, including: growth based on economies of scale; trade with product development; and product cycles. I argue that there is need for more work in this area in order to understand the relationship between trade and growth.

## **Economic Efficiency in Recent Tax Reform History: Policy Reversals or Consistent Improvements?**

**Don Fullerton and James B. Mackle**  
Working Paper No. 2593  
May 1988  
JEL No. 323

The Economic Recovery Tax Act of 1981 reduced personal marginal tax rates and provided significant business tax breaks. Subsequent changes through 1985 cut back on business allowances. The Tax Reform Act of 1986 reduced marginal rates again but added significantly to business taxes.

We use a general equilibrium model capable of second-best analysis to investigate the net effects on efficiency of each of these changes in capital income taxation. Under the new view that dividend taxes are not important disincentives to investment, there is no set of other parameters in the model for which these changes generate improvements in efficiency. However, under the old view that dividend taxes are important, these changes all increase efficiency for a wide range of values for other parameters in the model.

## **Unemployment Insurance, Recall Expectations, and Unemployment Outcomes**

**Lawrence F. Katz and Bruce D. Meyer**  
Working Paper No. 2594  
May 1988  
JEL No. 820

This paper shows the importance of accounting explicitly for the possibility of recalls when analyzing the determinants of durations of unemployment spells and the effects of unemployment insurance (UI) on unemployment outcomes in the United States. We use a unique sample of UI recipients from Missouri and Pennsylvania; it covers unemployment spells in 1979-81. We find that those *expecting* recall who are *not* recalled tend to have quite long unemployment spells. Furthermore, ex ante temporary layoff spells (the spells of individuals who initially expect to be recalled) may account for over 60 percent of the unemployment of UI recipients. They appear to account for much more unemployment than ex post temporary layoff spells (spells actually ending in recall). We estimate a competing-risks model in which finding a new job and recall are treated as alternative routes of leaving unemployment. Our results show that the recall and new job exit probabilities have quite different time patterns and often are affected in opposite ways by explanatory variables. We also find that the probability of leaving unemployment (both through recalls and through finding a new job) increases greatly around the time that UI benefits lapse.

## **Market Structure, Strike Activity, and Union Wage Settlements**

**John M. Abowd and Joseph S. Tracy**  
Working Paper No. 2595  
May 1988  
JEL Nos. 830, 611

We attempt to synthesize the industrial relations market structure hypothesis with the modern asymmetric information theory of wage and strike outcomes. The industrial relations literature contains a variety of arguments indicating that wage settlements should be related positively to the degree of product market sales concentration and the degree of product market coverage by the union. We specify an asymmetric information bargaining model that relates these same variables to strike probabilities as well as to wage settlements.

We conduct our empirical analysis for 1970-80 (strikes) and 1976-80 (wages). We find that the relationship between trade-adjusted sales concentration and wage settlements is positive at low levels of concentration but negative at high levels of concentration. The relationship is always negative for strike probabilities. We also find that the relationship between the trade-adjusted percentage of the product market covered by the same union and the percentage covered by other unions are related positively both to wage settlements and to strike probabilities. Our empirical analysis includes a rich set of controls, including unrestricted time and industry effects, which do not affect the major conclusions.

## **External Debt and Macroeconomic Performance in South Korea: A Summary**

**Won Am Park and Susan M. Collins**  
Working Paper No. 2596  
May 1988  
JEL Nos. 400, 110

During 1980-6, South Korea went from being the world's fourth largest debtor country, in the midst of an economic crisis, to a model of successful adjustment, with high growth rates and a current account surplus. This paper summarizes the findings of an in-depth analysis of Korea's performance, focusing on the experience with external debt.

We argue that the explanations for Korea's recovery are linked closely to the explanations for Korea's very rapid growth during the 1960s and 1970s. The centerpieces have been a comprehensive, export-focused investment plan, with external borrowing used to supplement domestic savings in financing the investment, and an active, interventionist government policy.

## **Sovereign Debt Renegotiations: A Strategic Analysis**

**Raquel Fernandez and Robert W. Rosenthal**  
Working Paper No. 2597  
May 1988  
JEL Nos. 026, 443

We model the process of rescheduling of debt between a creditor and a sovereign (LDC) debtor as a noncooperative game built on a one-sector growth model. We ignore as inherently incredible the creditor's threat to impose default penalties; instead, the debtor's motivation for repayment is to reap benefits from attaining an improved credit standing in international capital markets. The creditor can forgive portions of the outstanding debt so that a real-time bargaining process results; concessions are in the form of debt service payments by the debtor and debt forgiveness by the creditor. We find that the subgame-perfect equilibriums all result in Pareto optimums in which the creditor extracts all the surplus.

## **South Korea's Experience with External Debt**

**Susan M. Collins**  
Working Paper No. 2598  
May 1988  
JEL Nos. 400, 110

This paper examines South Korea's macroeconomic performance and experience with external debt from 1960-86. Korea accumulated most of its debt during three periods: 1966-9, 1974-5, and 1979-81. Each period involved an initial phase of economic difficulty and a slowdown in growth, followed by an impressive recovery. The paper reviews in some detail the economic and political developments during each cycle. Of particular interest are the shifts in economic policy as domestic authorities responded to external and internal developments.

## **Inflation and the EMS**

**Susan M. Collins**  
Working Paper No. 2599  
May 1988  
JEL No. 430

Since the European Monetary System (EMS) was instituted in March 1979, there has been a dramatic reduction in the inflation rates of member countries. This development is attributed widely to the EMS itself, but this paper argues that the theoretical and empirical basis for such a claim is far from conclusive.

On the theoretical side, the paper develops a model that highlights two issues. First, changes in the "rules" of the exchange rate system need not coincide with changes in expectations about central bank behavior. In fact, expectations in France do not seem to have changed until policymakers "got tough" in 1982-3. Second, different researchers have made quite different assumptions about exactly what "rules" the EMS imposes. How the system actually works does matter in terms of the effects that joining the EMS will have on inflation.

On the empirical side, the effects that have been attributed to the EMS are caused in large part by the global deflation since 1979 and by the fact that EMS members had relatively low inflation before 1979. However, even these estimates should be interpreted with caution. They are very sensitive to time period and to which non-EMS countries are included in the sample.

## **Promises, Promises: Credible Policy Reform via Signaling**

**Dani Rodrik**  
Working Paper No. 2600  
May 1988

Empirical experience and theory both suggest that policy reforms can be aborted or renewed if they lack sufficient credibility. One reason for such credibility problems is the legitimate doubt regarding how serious the government really is about the reform process. This paper considers a framework in which the private sector is unable to distinguish between a genuinely reformist government and its nemesis, a government that simply feigns interest in reform because it is a precondition for foreign assistance. The general conclusion is that the rate at which reforms are introduced may convey the government's future intentions and hence act as a signal of its "type." More specifically, credible policy reform may require going overboard: the government will have to go much further than it would have chosen to in the absence of the credibility problem.

## **Vertical Restraints and Producers' Competition**

**Patrick Rey and Joseph E. Stiglitz**  
Working Paper No. 2601  
May 1988

This paper examines the rationale for vertical restraints. It shows that there are important circumstances

under which these restrictions have significant anti-competitive effects. The paper focuses on the consequences of exclusive territorial arrangements among the retailers of two products that are imperfect substitutes. Such arrangements increase consumer prices; under plausible conditions, the increase in consumer prices is sufficiently large to more than offset the deleterious effects from "double marginalization" resulting from reduced competition among retailers. The imposition of exclusivity provisions may be part of a Nash equilibrium among producers. These results hold whether or not there are franchise fees.

### **An Economic Analysis of the Market for Law School Students**

**Ronald G. Ehrenberg**  
Working Paper No. 2602  
May 1988  
JEL Nos. 820, 912

This study uses data from a number of sources to estimate how lawyers' starting salaries relate to their ability, the quality of the law school they attended, and whether the law school was a private institution. I then perform a cost-benefit analysis of the value of attending a high-quality private institution. I also analyze how the financial attractiveness of law vis-à-vis other careers has changed in recent years and discuss a conceptual framework for law schools to use in allocating their financial aid resources.

### **Some Thoughts on the Role of Fiscal Policy in Stabilization and Structural Adjustment in Developing Countries**

**Willem H. Bulters**  
Working Paper No. 2603  
May 1988  
JEL Nos. 321, 311, 431

This paper analyzes the role of fiscal policy in the restoration of internal and external macroeconomic equilibrium and in achieving structural adjustment, that is, major changes in the patterns of sectorial and intertemporal resource allocation. The focus is on developing countries and newly industrializing countries in need of both stabilization and structural adjustment. I analyze the external transfer problem and the associated internal fiscal and real resource transfer problems with special emphasis on possible causes for the breakdown of the internal and external transfer processes. I use the concepts of national and public sector solvency to evaluate the mutual consistency and feasibility of fiscal, financial, and monetary plans, and I devote special attention to the link between the fiscal deficit and inflation, and to the inflation tax.

### **The Choice of Monetary Instrument in Two Interdependent Economies under Uncertainty**

**Stephen G. Turnovsky and Vasco d'Orey**  
Working Paper No. 2604  
June 1988

This paper analyzes the choice of monetary instrument in a stochastic, two-country setting where each country's set of monetary policy instruments includes both the money supply and the interest rate. It shows how the optimal choice of instrument is determined in two stages. First, for each pair, we determine the minimum welfare cost for each economy. This defines a pair of payoff matrixes. The second stage involves determining the Nash equilibrium for this bimatrix game. In our illustrative example for the alternative shocks considered, a dominant Nash equilibrium is always obtained.

### **An Analysis of Postwar U.S. Consumption and Saving: Part I—The Model and Aggregation**

Working Paper No. 2605

### **Part II—Empirical Results**

Working Paper No. 2606

**Michael J. Boskin and Lawrence J. Lau**  
June 1988  
JEL No. 220

We present a new empirical analysis of aggregate U.S. consumption and saving for 1947-80. We base the model on the theory of exact aggregation. It recognizes explicitly that households with different characteristics may be heterogeneous in their behavior; aggregate behavior may depend on the changing composition of households by characteristics and therefore may not be adequately portrayed by a representative consumer. Otherwise the model makes minimal assumptions about household behavior. The model integrates longitudinal and cross-sectional microeconomic data on household characteristics with the traditional aggregate time-series data. We test and reject various hypotheses on consumption, such as age independence, proportionality to wealth, and price independence. We find strong evidence of relative price effects and of a systematic variation of aggregate consumption with changing age distribution of wealth in the economy. Especially important is the substantial estimated difference in the shares of wealth consumed by households headed by persons born prior to, versus those born after, 1939. One important lesson from this study is that modeling the aggregate U.S. economy as a representative consumer may lead to misleading results.

## **The Debt Crisis: Structural Explanations of Country Performance**

**Andrew Berg and Jeffrey D. Sachs**  
Working Paper No. 2607  
June 1988  
JEL Nos. 441, 121, 123

This paper develops a cross-country statistical model of debt rescheduling and the secondary market valuation of LDC debt. It links these variables to key structural characteristics of developing countries, such as the trade regime, the degree of income inequality, and the share of agriculture in GNP. The most striking finding is that higher income inequality is a significant predictor of a higher probability of debt rescheduling in a cross-section of middle-income countries. We attribute this correlation to various difficulties of political management in economies with extreme inequality. We also find that outward orientation of the trade regime is a significant predictor of a reduced probability of debt rescheduling.

## **Federal Reserve Behavior Since 1980: A Financial Markets Perspective**

**William C. Melton and V. Vance Roley**  
Working Paper No. 2608  
June 1988  
JEL No. 311

We use the financial market's understanding of Federal Reserve behavior to examine recent changes in monetary policy. Primarily, we consider changes in the level of interest rates in response to specific types of economic information. Differences in the volatility of interest rates across periods provide additional evidence on changes in monetary policy regimes. The results indicate that monetary policy changed several times since 1980, either with respect to the Fed's targets or its desire to achieve its targets, or its operating procedures. The different regimes correspond to Federal Reserve statements about changes in policy. In this context, then, the evidence suggests that policy was credible.

## **Meteor Showers or Heat Waves? Heteroskedastic Intradaily Volatility in the Foreign Exchange Market**

**Robert F. Engle III, Takatoshi Ito, and Wen-Ling Lin**  
Working Paper No. 2609  
June 1988  
JEL Nos. 430, 313, 211

This paper defines and tests a form of market efficiency called "market dexterity" that requires that asset

prices adjust instantaneously and completely in response to new information. By examining the behavior of the yen/dollar exchange rate while each of the major markets is open, we can test for informational effects from one market to the next. Assuming that news has only country-specific autocorrelation (like a heat wave), any intradaily volatility spillovers (meteor showers) become evidence against market dexterity. We use ARCH models to model heteroskedasticity across intradaily market segments. Statistical tests lead us to reject the heat wave and therefore the market dexterity hypothesis. Using a volatility type of vector autoregression, we examine the impact of news in one market on the time path of volatility in other markets.

## **External Debt, Capital Flight, and Political Risk**

**Alberto Alesina and Guido Tabellini**  
Working Paper No. 2610  
June 1988  
JEL Nos. 430, 432

This paper explains the simultaneous occurrence in developing countries of a large accumulation of external debt, private capital outflows, and relatively low domestic capital formation. We consider a general equilibrium model in which two types of governments with conflicting distributional goals alternate randomly in office. Uncertainty over the fiscal policies of future governments generates private capital flight and little domestic investment. This political uncertainty also provides the incentives for the current government to overaccumulate external debt. The model also predicts that left-wing governments are more inclined to impose restrictions on capital outflows than right-wing governments are. Finally, we ask how political uncertainty affects the risk premium charged by lenders and how debt repudiation may occur after a change of political regime.

## **Advance Notice Provisions in Plant Closing Legislation: Do They Matter?**

**Ronald G. Ehrenberg and George H. Jakubson**  
Working Paper No. 2611  
June 1988  
JEL No. 820

This paper evaluates the cases for and against plant closing legislation. In spite of the growth of legislative efforts in the area, there has been surprisingly little effort devoted to analyzing the effects of: existing plant closing legislation; provisions in privately negotiated

collective bargaining agreements that provide for advance notice in case of plant shutdowns and/or layoffs; and voluntary employer provision of advance notice. This paper summarizes the results of previous research, and of our own empirical analyses that used the January 1984 Bureau of Labor Statistics Survey of Displaced Workers, on the effects of advance notice on displaced workers' durations of nonemployment and post-displacement earnings. Based upon these findings, we draw implications for public policy.

## **What Do Voluntary Export Restraints Do?**

**Kala Krishna**

Working Paper No. 2612

June 1988

JEL No. 422

This paper has two aims. First, I examine alternative ways of modeling Voluntary Export Restraints (VERs) in imperfectly competitive markets. This is important, since the effects of VERs are sensitive to the models used. Second, I argue that the effects of VERs also depend on whether goods are complements or substitutes. I illustrate this point by extending my (1983) model to allow complementary goods to be produced by domestic and foreign firms. If goods are substitutes, VERs set at free trade levels raise all profits; if goods are complements, the VERs have no effect. Thus, tariffs and quotas are not fundamentally equivalent under Bertrand duopoly when substitute goods are produced but are equivalent when complementary goods are being produced. I compared this to the case of Stackelberg leadership. I emphasize the importance of specifying the effects of *any* restriction on the payoff functions of agents and of using this to analyze its effects on equilibrium of the game.

## **Fiscal Policy with Impure Intergenerational Altruism**

**Andrew B. Abel and B. Douglas Bernheim**

Working Paper No. 2613

June 1988

JEL No. 321

Recent work demonstrates that dynastic assumptions guarantee that all redistributive policies, distortionary taxes, and prices, are irrelevant; the neutrality of fiscal policy (Ricardian equivalence) is only the "tip of the iceberg." In this paper, we investigate the possibility of reinstating approximate Ricardian equivalence by introducing a small amount of friction in intergenerational links. If Ricardian equivalence depends upon significantly shorter chains of links than these

stronger neutrality results do, then friction may dissipate the effects that generate strong neutrality without significantly affecting the Ricardian result. Although this intuition turns out to be essentially correct, models with small amounts of friction have other untenable implications. We conclude that the theoretical case for Ricardian equivalence remains tenuous.

## **Japanese Structural Adjustment and the Balance of Payments**

**Jeffrey D. Sachs and Peter Boone**

Working Paper No. 2614

June 1988

JEL No. 430

Policy discussions in Japan increasingly have recognized the important role of land values and land-use patterns in Japanese macroeconomic adjustment. In recent years, land wealth has constituted more than half of financial wealth, a proportion that is much higher than in the United States and other industrialized economies. Consequently, shifts in land-use patterns can have important effects on Japanese saving and investment patterns, and thereby on the Japanese trade balance and current account. This paper studies the implications of land-use policies for the Japanese macroeconomy using both a theoretical model and a multi-sectorial dynamic simulation model.

## **Production and Trade in Services by U.S. Multinational Firms**

**Irving B. Kravis and Robert E. Lipsey**

Working Paper No. 2615

June 1988

JEL Nos. 440, 635

Direct investment in foreign countries by U.S. goods industries represents a response to differences in labor costs to a much greater extent than the more rapidly growing investment by service industries. The latter seem to be less able to allocate different types of production to different areas of the world, probably because services are less tradable than goods; more often they must be produced where they are consumed or consumed where they are produced. Therefore, while direct investment abroad in goods industries represents an allocation of production that increases the demand for high-skill labor and for R and D input in the United States and decreases the demand for low-skill labor, direct investment in service industries, while it increases a firm's share of foreign markets, is likely to have little effect on the firm's demand for labor in the United States or on the composition of its labor force.

## **Deterioration of the Terms of Trade and Capital Accumulation: A Reexamination of the Laursen-Metzler Effect**

**Partha Sen and Stephen J. Turnovsky**

Working Paper No. 2616

June 1988

JEL No. 431

This paper analyzes the effects of both a permanent and a temporary deterioration in the terms of trade on a small open economy. The model, based on intertemporal optimization emphasizes the labor-leisure choice and the role of capital accumulation. Two main conclusions can be drawn from the analysis. First, in all cases the transitional dynamics depend critically upon the long-run response of the capital stock to the deterioration in the terms of trade. This has been shown to consist of a substitution effect, which is negative, together with an income effect, which is positive. Second, since the steady-state equilibrium depends upon the initial conditions of the economy, a temporary shock leads to a permanent effect on the economy by altering these initial conditions for some later date when the shock ceases.

Where the substitution effect dominates, a deterioration in the terms of trade leads to a short-run reduction in investment and a short-run current account surplus, contrary to the Laursen-Metzler effect. However, when the long-run income effect dominates, the deterioration in the terms of trade leads to a short-run investment boom, accompanied by a short-term current account deficit. The Laursen-Metzler effect prevails, although it is driven by investment, rather than by saving behavior.

## **Flexible Staffing Arrangements and Employers' Short-Term Adjustment Strategies**

**Katharine G. Abraham**

Working Paper No. 2617

June 1988

JEL Nos. 821, 824

This paper reports new evidence from a survey of over 400 U.S. employers on the use of temporary and on-call workers. More than 90 percent of the organizations that responded reported some reliance on these flexible staffing arrangements: they accounted for an average of 1.5 percent of total labor input at the user organizations during 1985; at some organizations, they accounted for 10 percent, or even 20 percent, of total labor input. Four-fifths of the survey respondents indicated that flexible staffing arrangements are important in absorbing workload fluctuations. Moreover, organi-

zations with highly seasonal or highly cyclical demand made significantly greater use of flexible staffing arrangements during 1985 than organizations with less seasonal or less cyclical demand. The use of flexible staffing arrangements appears to be a more important component of employers' short-term adjustment strategies than has been recognized previously.

## **Do Developing Countries Lose from the MFA?**

**Irene Trela and John Whalley**

Working Paper No. 2618

June 1988

This paper estimates both the national and the global welfare costs of bilateral quotas on textiles and apparel. We use an applied general equilibrium model that covers bilateral quotas negotiated among three major developed importing countries (the United States, Canada, and the European Economic Community) and 34 supplying, developing countries under the provisions of the Multifiber Arrangement that applied in the mid-1980s (MFA III).

Using 1986 data, we show that the vast majority of developing countries gain from MFA removal, with some gaining proportionately more than others. This suggests that despite foregone rent transfers, developing countries would receive gains by eliminating the MFA. In the central variant analysis, all developing countries gain by eliminating tariff and MFA restrictions because, contrary to popular belief, the developing countries (including Hong Kong, South Korea, and Taiwan) are relatively small compared to the developed countries, even in apparel production. Rather than losing share to other developing countries under an MFA elimination, the higher-income developing countries (like other developing countries) gain market share at the expense of reduced developed country production.

## **Heterogeneity in Panel Data: Are There Stable Production Functions?**

**Jacques Malresse and Zvi Griliches**

Working Paper No. 2619

June 1988

JEL Nos. 210, 226

We estimate separate production functions for approximately 450 manufacturing firms in France, 450 in the United States, and 850 manufacturing firms in Japan, covering the 13-year period from 1967-79. We focus on the wide dispersion in the estimated slope coefficients in all three countries. The main question we ask is: "Is this dispersion real?" Could it be just a reflection of sampling variability, or is it an indication of real heterogeneity? We estimate the "true" dispersion using three different approaches: maximum likelihood; regressions



of squares and cross-products of residuals; and Swamy's "residual" method. We then try to interpret the somewhat different answers that emerge. In particular, we investigate the "reality" of the estimated heterogeneity by looking at its stability over time and by relating it to differences in capital shares and the industrial structure. We conclude that the observed heterogeneity is not "real." It is caused by some nonstable misspecification of our simple model, implying that we are unlikely to discern different but stable individual production relationships in samples of this size that contain only a limited number of the economically relevant variables.

## **Bolivia's Economic Crisis**

**Juan Antonio Morales and Jeffrey D. Sachs**

Working Paper No. 2620

June 1988

By any standard, Bolivia's economic crisis in the 1980s has been extraordinary. Like its neighbors, Bolivia suffered from major external shocks, but the extent of economic collapse in the face of these shocks (including a hyperinflation during 1984-5) suggests that internal factors as well as external shocks have been critical to Bolivia's poor economic performance. One major theme of our work is that the recent economic crisis in Bolivia is a reflection of political and economic conflicts that have undermined the development process throughout this century. While major reforms have been started by the present government, many of the deepest problems in Bolivian society that contributed to the crisis remain unresolved.

## **Stock Prices under Time-Varying Dividend Risk: An Exact Solution In an Infinite-Horizon, General Equilibrium Model**

**Andrew B. Abel**

Working Paper No. 2621

June 1988

JEL No. 313

This paper analyzes the effects of changes in risk, using a general equilibrium model in which the conditional risk evolves stochastically over time. The savings decisions of consumers take account of the fact that conditional risk is a serially correlated random variable. By restricting the specification of consumers' preferences and the stochastic specification of dividends, it is possible to obtain an exact solution for the prices of the aggregate stock and riskless one-period bonds. An increase in the conditional risk reduces the stock price if and only if the elasticity of marginal utility is less than one.

## **Data Difficulties In Labor Economics**

**Daniel S. Hamermesh**

Working Paper No. 2622

June 1988

JEL Nos. 820, 220

This essay sets out a framework for evaluating empirical work in terms of the ability of the data to provide adequate parameter estimates and hypothesis tests about the true underlying structure. It discusses problems of aggregation, representativeness, and structural change in detail. These criteria are used to evaluate studies of labor supply, labor demand, local labor markets, and union goals. Empirical work in labor supply has made the greatest strides because of the appropriateness of the data for answering questions of interest. Studies in the other areas have not made as much progress and will not until the same resources are devoted to collecting longitudinal microeconomic data on firms as have been spent on collecting longitudinal data on households.

## **Sovereign Debt: Is to Forgive to Forget?**

**Jeremy I. Bulow and Kenneth Rogoff**

Working Paper No. 2623

June 1988

International lending to a less developed country (LDC) cannot be based on the debtor's reputation for making repayments. That is, loans to LDCs will not be made or repaid unless foreign creditors have legal or other direct sanctions that they can exercise against a sovereign debtor who defaults. Even if some lending is feasible because of direct sanctions, a small LDC's ability to borrow is in no way enhanced by having a reputation for repayment.

## **R and D, Patents, and Market Value Revisited: Is There a Second (Technological Opportunity) Factor?**

**Zvi Griliches, Bronwyn H. Hall, and Arlel Pakes**

Working Paper No. 2624

June 1988

JEL No. 621

Innovations in the market value of manufacturing firms and their R and D expenditures are related (Pakes [1985] and Mairesse and Siu [1984]). This could be caused by shifts in the demand for the output of a par-

ticular firm, shifts in the technological opportunities available to the firm, or both. In this paper, we use innovations in patenting activity as an additional piece of information about technological shifts in order to identify the relative importance of these two types of shocks. We build a simple two-factor model of innovations in sales, investment, R and D investment, patent applications, and the rate of return to holding a share of the firm, and estimate it using a time-series cross section of U.S. manufacturing firms (340 firms from 1973 to 1980).

Except in the pharmaceutical industry, we find little evidence of a factor that can be identified clearly with technological opportunity, although there is evidence of a long-run growth factor linking both types of investment, patenting activity, and the market value of the firm. We go on to demonstrate that this null result could be caused by our use of patent counts as an indicator of the value of the underlying patents: under reasonable assumptions on the value distribution, the changes in patenting rates can account for only an infinitesimal fraction of the changes in the stock market value of the firm, and hence provide essentially no additional information to the estimation procedure. However, the pharmaceutical industry is an important exception to this: here we find that the technological factor is almost as important as the short-run demand factor in explaining movements in the rate of return, although both factors together account for less than 5 percent of the variance of this variable.

### **Self-Fulfilling Expectations, Speculative Attacks, and Capital Controls**

**Harris Dellas and Alan C. Stockman**  
Working Paper No. 2625  
June 1988

This paper examines the endogenous implementation of capital controls in the context of a fixed exchange rate regime. It shows that if the policymaker may respond to a speculative attack on official foreign reserves with the introduction of controls, then such an attack may occur even when current and expected monetary policy is consistent with a permanently viable, control-free fixed exchange rate regime. Consequently, capital controls may be the outcome of self-fulfilling expectations rather than the result of imprudent economic policies.

### **What Does the Term Structure Tell Us About Future Inflation?**

**Frederic S. Mishkin**  
Working Paper No. 2626  
June 1988

This paper examines empirically what the term structure of interest rates tells us about future inflation. The

evidence indicates that the information in the term structure about the future path of inflation is quite different at the shortest end of the term structure (maturities six months or less) than it is for maturities of nine to twelve months. For maturities of six months or less, in all the sample periods examined—February 1964 to December 1986, February 1964 to October 1979, November 1979 to October 1982, November 1982 to December 1986—the term structure provides almost no information about the future path of inflation. On the other hand, at this end of the term structure the results indicate that the term structure of nominal interest rates contains a great deal of information about the term structure of *real* interest rates. This finding is quite important because it suggests that researchers can examine observable data on the shortest end of the nominal term structure to provide them with information about the behavior of the *real* term structure.

For maturities of nine and twelve months, the term structure appears to contain information about the future path of inflation in the full sample period and in the subperiods before October 1982. At these longer maturities, however, there does not appear to be much information in the nominal term structure about the term structure of real interest rates.

This paper suggests that some caution should be exercised in using the term structure of interest rates as a guide for assessing inflationary pressures in the economy, as is currently under consideration by the Federal Reserve. Although there is apparently significant information in the term structure about the future path of inflation for maturities greater than six months, there is no information about the future path of inflation that can be obtained from the shorter end of the term structure.

### **Consumer Discrimination and Self-Employment**

**George J. Borjas and Stephen G. Bronars**  
Working Paper No. 2627  
June 1988

Self-employment rates and incomes differ significantly by race. We show that these differentials arise in markets with consumer discrimination and incomplete information about the price of the good and the race of the seller. Equilibrium income distributions have two properties: mean black incomes are lower than mean white incomes, and the returns to ability are lower for black than for white sellers. Therefore, able blacks are less likely to choose self-employment than able whites are. Using the 1980 Census data, we find that observed differences in the self-employment income distributions are consistent with the theoretical predictions.

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