

NBER Reporter

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Program Report

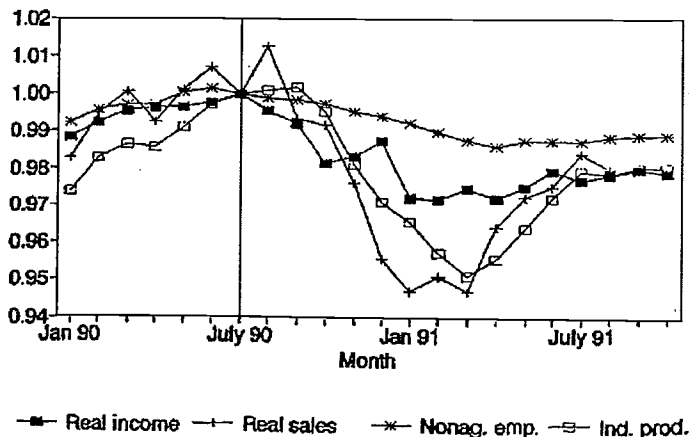
The Business Cycle Dating Process

Robert E. Hall*

The 1990 Peak

In April 1991, the NBER's Business Cycle Dating Committee determined that a recession had started in July 1990. Figure 1 shows the data that most strongly influenced the committee: real personal income less transfers, real sales in manufacturing and trade, nonagricultural employment (because 1990 was a Census year, the committee looked at private nonagricultural employment, and nonagricultural employment minus Census workers), and industrial production. The figure shows the basic problem of dating a business cycle: that different cyclical indicators have different turning points.

Figure 1 The Recession of 1990-??



—■— Real income —+— Real sales —*— Nonag. emp. —□— Ind. prod.

*Hall is Chairman of the NBER's Business Cycle Dating Committee.

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This issue of the *Reporter* highlights the work of the Bureau's Business Cycle Dating Committee, chaired by Robert E. Hall. Next, Maurice Obstfeld describes his research on exchange rate targets. After 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.

In Figure 1, all four series are normalized so that they have a value of 1 in July. Real income peaked in exactly that month. Real sales, a more volatile series, reached a pronounced peak in August. Employment peaked in June. And industrial production peaked in September.

The U.S. economy in 1990 reflected the combined influence of two different forces. One was a very broad slowdown starting in the spring. The other was a sharp contraction in industries (automobile and others) following the spike in oil prices in August. The result was an unusual combination of leading employment and lagging industrial production. The July peak date was a reasonable compromise. It embodied the notion that breadth, or dispersion, is an important characteristic of a recession. When measures that span all sectors of the economy—income and employment—peak earlier, the fact that goods production stayed strong for two added months should not control the date of the recession.

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The 1991 Trough?

Figure 1 also shows some of the challenges that will face the NBER Business Cycle Dating Committee in determining the date of the trough in economic activity. First, the figure makes it completely clear that any such determination in the near future would be quite premature. Should the economy begin to contract again, it is a distinct possibility that the trough would occur in late 1991 or 1992. A trough date cannot be assigned until activity has reached a sufficiently high level that a contraction would be a new recession, not a continuation of the existing one. As of October 1991, all four indicators were well below their July 1990 peaks, and one, employment, was hardly above its lowest level, attained in April 1991.

If the current pause is nothing more than a pause, and the expansion resumes, the trough date will be sometime in early 1991. Real income reached its bottom in February, real sales in January and again in March, employment in April, and industrial production in March.

Comparison with 1981-2

Figure 2 shows the same series in the same format for the last peak-trough combination, July 1981 and November 1982. Note the difference in the vertical scale—the earlier contraction was about twice as deep as the current one. Again, the peak date is a compromise. Real income peaked in August. Real sales were well below their January 1981 level by July. Employment and industrial production both peaked in July.

Disagreement among the indicators was much more severe around the trough in November 1982. Real income reached bottom a month earlier, in October. Real sales coincided with the trough date in November. Employment and industrial production lagged by two months.

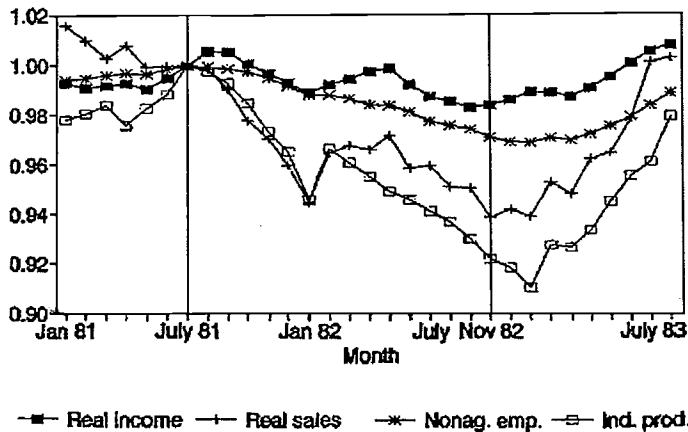
The false trough of January 1982 is a dramatic example of the need to wait until the recovery has reached close to the past peak before identifying a trough. The NBER committee did not declare the trough date until July 1983.

Special Features of the 1990-1 Recession

All recessions are hard to forecast, and the most recent is no exception. But this recession is particularly remarkable for the breakdown of the one apparently reliable principle of recession forecasting that had held previously. Financial market stress rather systematically preceded almost all previous recessions. Many different indicators of stress have been shown to have some forecasting power, including the stock market, monetary aggregates, and interest rates. The measures with the greatest forecasting success, according to systematic research carried out by James H. Stock and Mark W. Watson¹ with the support of the NBER,

¹J. H. Stock and M. W. Watson, "New Indexes of Coincident and Leading Economic Indicators," *NBER Reprint No. 1380, April 1990*, and in *NBER Macroeconomics Annual 1989*, O. J. Blanchard and S. Fischer, eds. Cambridge, MA; MIT Press, 1989, pp. 351-394.

Figure 2 The Recession of 1981-2



are the differential between private and government short-term interest rates (specifically, the six-month commercial paper rate less the six-month Treasury bill rate)² and the differential between long and short rates (specifically, the 10-year Treasury bond rate less the one-year rate). When the private short-rate premium rises sharply and short rates rise relative to long rates, the probability of a recession within a year rises dramatically. These two variables dominate all others in forecasting regressions.

In the typical recession, financial stress is followed by collapsing activity in sectors sensitive to financial developments, notably manufacturing and construction. The recession then spreads to the rest of the economy. The Stock-Watson interest rate measures showed signs of mild financial stress in 1989, but turned bullish before the recession began in 1990. Based on historical statistical relationships, Stock and Watson derived extraordinarily low probabilities of an impending recession in early 1990, even when conventional forecasters were gloomy. Apparently the current recession is a very different animal from others summarized in the data Stock and Watson used. In particular, this recession began outside of the financially sensitive sector of the economy.

In another respect, the behavior of the economy during this recession fits into historical relationships. Sharp increases in oil prices cut auto sales and other elements of manufacturing demand. The relationship of oil price increases to recessions has received a great deal of attention since the 1973-4 and 1979 shocks. James D. Hamilton has argued that the Suez oil price increase in 1956 was a factor in the 1957-8 recession as well.³ Interestingly, the oil price effect seems to be asymmetric; there was no sharp stimulus to the U.S. economy when oil prices collapsed in 1986. In this recession, oil prices

²B. M. Friedman and K. N. Kuttner, "Why Does the Paper-Bill Spread Predict Real Economic Activity?" NBER Working Paper No. 3879, October 1991.

³J. D. Hamilton, "Oil and the Macroeconomy Since World War II," *Journal of Political Economy* A1 (April 1983), pp. 228-248.

rose in August 1990 (just after the recession began) and fell back in January. Although the period of high oil prices was brief, the asymmetry of the response may make the oil shock of 1990 a lasting factor in this recession.

Research Summary

Exchange Rate Targets

Maurice Obstfeld

When massive speculative attacks shattered the system of fixed exchange rates among industrial countries in early 1973, policymakers viewed the shift to generalized floating rates as a tactical retreat. Nearly 19 years later, however, most industrial countries' exchange rates continue to float against the U.S. dollar. Nonetheless, in the past decade the world economy has evolved in the direction of more limited exchange rate flexibility.

The group of countries participating in the exchange rate mechanism (ERM) of the European Monetary System has expanded since the system's inception in 1979, and the original adjustable-peg regime has given way to one in which realignments increasingly are avoided. Developing countries, as well as the transforming economies of the former Soviet bloc, have used stable external exchange rates both as anti-inflationary anchors and as a conduit for importing informative signals from world markets about relative prices. Finally, during the late 1980s the main industrial countries intervened heavily against the dollar in foreign exchange markets, and in some periods targeted the dollar exchange rates of major currencies.

Academic economic research has mirrored and, it is fair to say, encouraged the movement toward more deliberate exchange rate management. In the late 1960s and early 1970s, a significant school of academic opinion favored abandoning the Bretton Woods adjustable peg system in favor of floating rates determined by the market; the system's final collapse in February 1973 initially appeared to vindicate that view. The subsequent performance of the world economy revealed, however, that floating exchange rates were not the panacea that their early advocates had promised. It remains widely accepted that some economic disturbances require exchange rate adjustment. But it is also recognized that floating rates can move sharply and in

ways that bear no close short-term relationship to international costs; they do not prevent persistent departures from current account balance; their movements redistribute income domestically, creating political pressures inimical to free trade; and they may present governments with harmful macroeconomic incentives.

My research has focused on several aspects of exchange rate targeting. One set of studies has addressed the problem of imperfect government credibility under managed exchange rates. A second examines the theory of exchange rate target zones and regime switches under uncertainty. A final area of research concerns the role of official foreign exchange intervention in pursuit of exchange rate targets. I now summarize some of this work, along with some related studies by other NBER researchers.

Credibility and Exchange Rate Management: The Case of Europe

When the eight original members of the European ERM began to peg their mutual exchange rates in March 1979, relatively few observers would have bet heavily on the system's survival. Annual inflation rates at that time ranged from 2.7 percent in Germany to 12.1 percent in Italy, and the looming prospects of recession and higher oil prices augured poorly for the future of ERMs. Indeed, the first phase of ERM history was rather turbulent, punctuated by periodic speculative crises. To date, there have been 11 substantive realignments of intra-ERM exchange rates.¹

The last ERM alignment—that of the French franc in January 1987—apparently inaugurated a new phase marked by startling successes. Since then, exchange rates have remained stable, even though France and Italy have dismantled their remaining controls on foreign exchange transactions and capital movements; Spain and the United Kingdom have joined the mechanism; Italy has narrowed the band of fluctuation permitted to the lira under the ERM agreement; swap networks among the participating central banks have been enhanced; and several nonparticipating countries, including Norway and Sweden, have started to orient their exchange rate policies toward maintaining the ERM peg. Some observers argue that the discipline of the ERM enabled certain countries to ride in the wake of the German Bundesbank's anti-inflationary reputation.

This impressive track record, together with the momentum toward further economic and political integration within Europe, has enhanced the credibility of ERM exchange rate parities. Yet the system's ability to weather severe shocks that may lie ahead remains doubtful—whether the shocks emanate from domestic policies, German reunification, or some other source impossible to foresee today.

Data from financial markets reflect these doubts. In 1990, for example, Italy's long-term government bond interest rate exceeded Germany's by 310 basis points.² Such discrepancies would imply large unexploited profit opportunities under the hypothesis that the Deutsche mark/lira rate is irrevocably confined to its current fluctuation limits.³ More plausibly, markets may perceive implicit (and explicit) "escape clauses"—contingencies in which national authorities may realign exchange rates or suspend free capital mobility despite paper commitments to eventual monetary union.

My own analysis of exchange rate escape clauses reveals some macroeconomic implications that may be problematic.⁴ Escape clauses have the potential for raising welfare by giving authorities additional freedom to respond to exceptional economic shocks. Yet it is difficult to ensure that, once this freedom is granted, it will not be exercised more often than is socially optimal. I consider a policymaker who cares about employment and exchange rate variability but faces a fixed political cost of realigning the national currency. Even if this cost is consistent with an optimal frequency of realignment, there may be additional equilibriums in which the policymaker accommodates high inflationary expectations by devaluing. Because there is no way for authorities to forswear accommodation credibly, the actual outcome of the escape clause option may be inferior to a rigidly fixed exchange rate.

An additional factor straining ERM credibility is the sharp variation in public indebtedness among member countries. In 1990, ratios of net general government debt to GDP ranged from a low of 23 percent in Germany to a high of 121 percent in Belgium, with Italy's ratio of 98 percent near the upper end.⁵ Observers worry that such high-debt governments as Italy face a powerful incentive to inflate away their normal obligations, and suggest that this incentive may build an expected inflation premium into long-term nominal interest rates.⁶ Several studies have examined whether skillful man-

²See OECD Economic Outlook 49 (July 1991), Table 4, p. 11.

³For a detailed analysis, see A. Giovannini, "European Monetary Reform: Progress and Prospects," Brookings Papers on Economic Activity 2 (1990).

⁴M. Obstfeld. "Destabilizing Effects of Exchange Rate Escape Clauses," NBER Working Paper No. 3603, January 1991. NBER researchers R. P. Flood, V. U. Grilli, T. Persson, and G. Tabellini have done related work.

⁵OECD Economic Outlook 49 (July 1991), Table 32, p. 113.

⁶I explore some dynamic implications of these incentives in "A Model of Currency Depreciation and the Debt-Inflation Spiral," NBER Reprint No. 1498, January 1991, and Journal of Economic Dynamics and Control 15 (January 1991); and in "Dynamic Seigniorage Theory: An Exploration," Centre for Economic Policy Research Discussion Paper No. 519, March 1991. (Original version issued as NBER Working Paper No. 2869, February 1989.)

¹F. Giavazzi and A. Giovannini, Limiting Exchange Rate Flexibility: The European Monetary System, Cambridge, MA: MIT Press, 1989, provides a comprehensive review.

agement of the currency composition and maturity structure of government liabilities may reduce the temptation to depreciate the public debt via inflationary surprises. A related literature considers how the maturity structure of debt may limit a government's vulnerability to exchange rate crises and related lapses of confidence.⁷ One serious concern is whether the ERM central banks' commitment to mutual intervention support could make credibility crises contagious.

Related work by NBER Research Associates Kenneth A. Froot and Kenneth Rogoff looks at the stability of ERM exchange rates during the transition to a single European currency.⁸ They describe an "end-game" scenario in which national central banks, restrained until the moment of transition by the need to preserve their anti-inflation reputations, devalue national debts just as the European currency is born. Their general point is that credibility problems may become more evident as major steps toward economic union proceed.

Target Zones and Regime Switches

ERM exchange rates fluctuate within narrow limits, as did Bretton Woods exchange rates and even exchange rates under a gold standard. In recent literature, NBER Research Associate Paul R. Krugman finds that a perfectly credible band will have a stabilizing effect on the exchange rate. The exchange rate will remain within its limits for a wider range of its fundamental economic determinants, and its response to changes in these determinants will be muted.⁹

Froot and I have extended Krugman's analysis of target zones and have shown how to apply its principles to a wide range of anticipated shifts in the exchange rate regime: for example, a switch from floating to fixed rates that is triggered when a random variable such as the money supply reaches a pronounced threshold. One important implication of this work is that relationships between exchange rates and their economic de-

terminants may well be nonlinear when drastic regime changes are possible. But these nonlinearities may be hard to detect without long historical data series.¹⁰

Other empirical work has focused on testing the target-zone model against ERM data. Robert P. Flood, Andrew K. Rose, and Donald J. Mathieson find little support for the model. However, Giuseppe Bertola and Lars E. O. Svensson, and Svensson and Rose, find that the introduction of time-varying realignment risk improves the model's ability to match the data. Kathryn M. Dominguez and Peter B. Kenen argue that ERM intervention practices have not conformed to the simple target zone model. They provide empirical evidence to support that view.¹¹

Foreign Exchange Intervention

On September 22, 1985, finance ministers and central bank governors of the Group of Five industrial countries dramatically announced their determination to depreciate the U.S. dollar. This Plaza Accord—named after the New York hotel that hosted the G-5 meeting—marked the start of a period of highly publicized management of the dollar exchange rates of major industrial currencies. The subsequent Louvre Accord of February 22, 1987 set up informal target zones for the dollar against the yen and the Deutsche mark, zones that were definitively breached after the October 1987 stock market crash.

Although the Louvre currency zones have not been abandoned formally—they were never announced formally—recent ministerial communiqués have shifted attention away from exchange rate issues. Nonetheless, the experience of the late 1980s offered a fresh chance to rethink the economics of foreign exchange intervention and to evaluate its effects anew.

Naturally, a number of questions arise. First, does "pure" or sterilized intervention—intervention that is not allowed to affect national money supplies—have significant effects on the exchange rate? (Much post-Plaza intervention was sterilized in some way.) In other

⁷See, for example, T. Persson and G. Tabellini, *Macroeconomic Policy, Credibility, and Politics*, Chur, Switzerland: Harwood Academic Publishers, 1990; G. A. Calvo and M. Obstfeld, "Time Consistency of Monetary and Fiscal Policy: A Comment," *Econometrica* 58 (September 1990); and the papers by A. Alesina, A. Prati, and G. Tabellini; by F. Giavazzi and M. Pagano; and by G. A. Calvo and P. Guidotti in *Public Debt Management: Theory and History*, R. Dornbusch and M. Draghi, eds., Cambridge, U.K.: Cambridge University Press, 1990. For a general discussion of links between monetary union and fiscal harmonization, see B. J. Eichengreen, "One Money for Europe? Lessons from the U.S. Currency Union," *Economic Policy* 10 (April 1990).

⁸K. A. Froot and K. Rogoff, "The EMS, the EMU, and the Transition to a Common Currency," NBER Working Paper No. 3684, April 1991.

⁹P. R. Krugman, "Trigger Strategies and Price Dynamics in Equity and Foreign Exchange Markets," NBER Working Paper No. 2459, December 1987, and "Target Zones and Exchange Rate Dynamics," NBER Working Paper No. 2481, January 1988, and forthcoming in *Quarterly Journal of Economics*. Further references can be found in *Exchange Rate Targets and Currency Bands*, P. R. Krugman and M. H. Miller, eds., Cambridge, U.K.: Cambridge University Press, 1991.

¹⁰See K. A. Froot and M. Obstfeld, "Exchange Rate Dynamics under Stochastic Regime Shifts: A Unified Approach," NBER Working Paper No. 2835, February 1989, and forthcoming in *Journal of International Economics*; and "Stochastic Process Switching: Some Simple Solutions," NBER Reprint No. 1585, August 1991, and *Econometrica* 59 (January 1991).

¹¹R. P. Flood, A. K. Rose, and D. J. Mathieson, "An Empirical Exploration of Exchange Rate Target Zones," NBER Working Paper No. 3543, December 1990; G. Bertola and L. E. O. Svensson, "Stochastic Devaluation Risk and the Empirical Fit of Target Zone Models," NBER Working Paper No. 3576, January 1991; A. K. Rose and L. E. O. Svensson, "Expected and Predicted Realignments: The FF/DM Exchange Rates During the EMS," NBER Working Paper No. 3685, April 1991; and K. M. Dominguez and P. B. Kenen, "On the Need to Allow for the Possibility That Governments Mean What They Say: Interpreting the Target-Zone Model of Exchange Rate Behavior in the Light of EMS Experience," NBER Working Paper No. 3670, April 1991.

words, can intervention be viewed as a tool of macro-economic policy that somehow can be exercised independent of monetary and fiscal policy?

Second, if intervention has effects on exchange rates, do they arise exclusively because intervention is a signal of official intentions about future monetary and fiscal policies? Or, does intervention have distinct effects by altering the currency composition of the bond portfolio that private markets must hold? If there are only signaling effects, then intervention is not an independent policy tool, since it must be followed by concrete policy shifts for signals to remain credible. But it is still crucial to ask how intervention signals can acquire credibility, and to determine what information (if any) policymakers communicate through intervention that they could not communicate through some other medium.¹²

In a review of the 1985-8 period of coordinated intervention, I argue that the broad realignment of dollar exchange rates is explained adequately by shifts in fiscal, and especially monetary, policies.¹³ The signaling effect of intervention appears to have been important, particularly on occasions when central banks intervened on a concerted basis. But there are significant instances, both from 1985-8 and after, when intervention was shrugged off by the foreign exchange market pending more substantive shifts in policy.

Not all investigators concur with these conclusions about the effect of intervention. In a study based on data provided by the Bundesbank, the Federal Reserve, and the National Bank of Switzerland, Jeffrey A. Frankel and Kathryn M. Dominguez find that pure intervention has a statistically detectable portfolio effect, but that the effect is not large when the intervention is not announced.¹⁴ This suggests some independent role for intervention, but is consistent with the assertion that much of the apparent effectiveness of intervention comes from its effect on expectations of future monetary and fiscal policies.

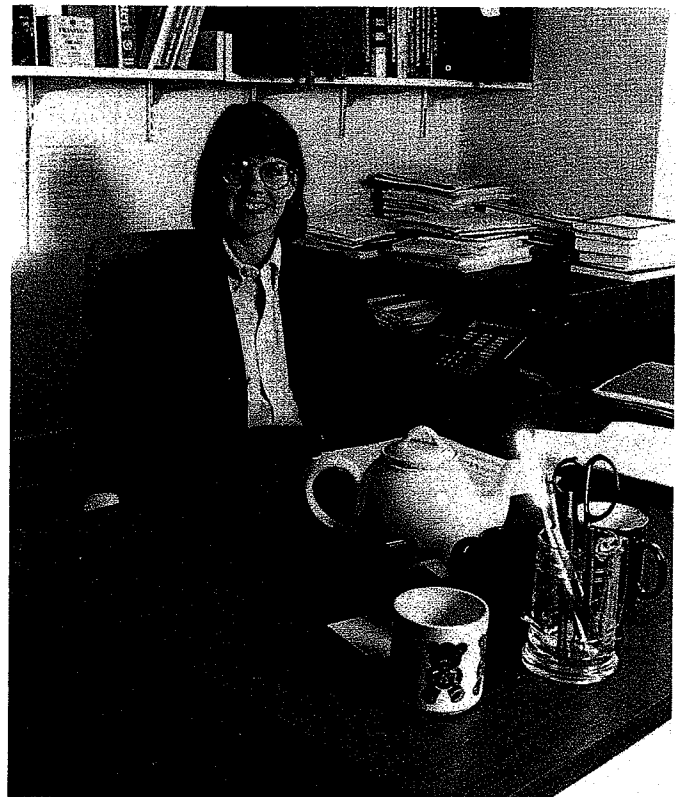
Michael W. Klein and Karen K. Lewis empirically model the foreign exchange market's beliefs about the authorities' dollar/yen and dollar/Deutsche mark exchange rate targets.¹⁵ After analyzing daily data for the period of the Louvre Accord preceding the stock mar-

ket crash, Klein and Lewis conclude that market perceptions of the implicit Louvre exchange rate bands evolved substantially in response to observed interventions. Their result underscores the importance of the signaling channel, and highlights the volatility of expectations even during a period of supposedly successful policy coordination.

NBER Profiles

Nancy L. Rose

Nancy L. Rose is a research associate and director of the NBER's Program in Industrial Organization. She is also an associate professor of applied economics at MIT's Sloan School of Management, where she teaches microeconomics and industrial organization. Her research focuses primarily on the influence of government regulations on firm behavior and industry performance. Recent projects have explored the determination of pricing structures and safety performance in the deregulated airline industry.



Rose was an undergraduate at Harvard University and received her Ph.D. from MIT's Economics Department. In 1991, Rose was honored by the National Sci-

¹²For a more extensive discussion of the general issues, see M. Obstfeld, "Exchange Rates, Intervention, and Sterilization," NBER Reporter, Fall 1982.

¹³M. Obstfeld, "The Effectiveness of Foreign Exchange Intervention: Recent Experience, 1985-8," in NBER Reprint No. 1525, February 1991, and in International Policy Coordination and Exchange Rate Fluctuations, W. H. Branson, J. A. Frenkel, and M. Goldstein, eds., Chicago: University of Chicago Press, 1990.

¹⁴J. A. Frankel and K. M. Dominguez, "Does Foreign Exchange Intervention Matter? Disentangling the Portfolio and Expectations Effects for the Mark," NBER Working Paper No. 3299, March 1990.

¹⁵M. W. Klein and K. K. Lewis, "Learning About Intervention Target Zones," NBER Working Paper No. 3674, April 1991.

ence Foundation as one of the nation's top 100 mid-career women scientists.

Rose is married to James M. Poterba, an NBER research associate and director of the Bureau's Program in Taxation. They live in Belmont with their two young sons, Matthew (2) and Timothy (6 months).

Robert W. Vishny

Robert W. Vishny is director of the NBER's Program in Corporate Finance and a professor of finance at the University of Chicago's Graduate School of Business.

Vishny received his A.B. from the University of Michigan in 1981 and his Ph.D. in economics from MIT in 1985. He joined the Chicago faculty as an assistant professor that year, and was promoted to professor in 1989.



Vishny's work in corporate finance has been published in professional journals and in the NBER Working Paper series. He also is associate editor of the *Journal of Financial Economics*, *Journal of Finance*, and the *Quarterly Journal of Economics*.

Vishny and his wife, Keren, live in Wilmette. She is a physician, finishing her residency in internal medicine at the University of Chicago Hospitals. Vishny collects tribal art, and enjoys music.

Conferences

International Aspects of Taxation

Nearly 40 economists attended an NBER conference on "The International Aspects of Taxation" in New York on September 27 and 28. The program, organized by NBER Research Associates Alberto Giovannini, Columbia University; Joel B. Slemrod, University of Michigan; and R. Glenn Hubbard, currently on leave at the U.S. Department of the Treasury, was:

Roy D. Hogg, Arthur Andersen and Company, and Jack M. Mintz, Queen's University, "Canadian and U.S. Tax Reform Impacts on the Financing of Canadian Subsidies of U.S. Parents"

Discussant: Neil Bruce, University of Washington

James R. Hines, Jr., NBER and Princeton University, "On the Sensitivity of R and D to Delicate Tax Changes: The Behavior of U.S. Multinationals in the 1980s"

Discussant: Bronwyn H. Hall, NBER and University of California, Berkeley

Bruce C. Greenwald, Bell Communications Research, and Joseph E. Stiglitz, NBER and Stanford University, "Local Financing Alternatives and the International Incidence of Corporate Income Taxes"

Discussant: Jonathan Eaton, NBER and Boston University

Roger H. Gordon, NBER and University of Michigan, and Joosung Jun, NBER and Yale University, "Taxes and the Form of Ownership of Foreign Corporate Equity"

Discussant: Alberto Giovannini

Alan J. Auerbach, NBER and University of Pennsylvania, and Kevin A. Hassett, Columbia University, "Taxation and Foreign Direct Investment in the United States: A Reconsideration of the Evidence" (NBER Working Paper No. 3895)

Discussant: James M. Poterba, NBER and MIT

Timothy J. Goodspeed, Florida International University; Harry Grubert, U.S. Department of the Treasury; and Deborah L. Swenson, Duke University, "Explaining the Low Taxable Income of Foreign-Controlled Companies in the United States"

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

David Harris and Bernard Yeung, University of Michigan; Randall Mørck, University of Alberta; and

Joel B. Slemrod, "Income Shifting in U.S. Multinational Corporations" (NBER Working Paper No. 3924)

Discussant: John H. Mutti, Grinnell College

Rosanne Altshuler, NBER and Columbia University, and Scott Newlon, U.S. Department of the Treasury, "The Effects of U.S. Tax Policy on the Income Repatriation Patterns of U.S. Multinational Corporations" (NBER Working Paper No. 3925)

Discussant: Daniel J. Frisch, Horst & Frisch

G. Peter Wilson, Harvard University, "The Role of Taxes in Location and Sourcing Decisions"

Discussant: R. Glenn Hubbard

Hogg and Mintz find that leverage ratios of Canadian subsidiaries of U.S. parents have increased only slightly as a result of U.S. and Canadian tax reforms undertaken in 1986-7. Cross-border charges (interest, royalties, and fees) did not rise. However, dividends remitted to U.S. parents rose significantly. The share of companies issuing dividends rose from 17 percent in 1983-5 to 45 percent in 1987-9. The dividend payout ratio also increased from 30 percent in 1983-9 to nearly 70 percent in 1987-9. When U.S. companies remitted Canadian income, they tended to use both cross-border charges and dividends to minimize taxes paid to both U.S. and Canadian governments.

Prior to 1986, for tax purposes, U.S. multinational firms could deduct all of their domestic R and D expenses against their U.S. income. After 1986, some firms could take only a partial deduction (while other multinationals continued to receive all of the benefits of 100 percent deductibility). Hines finds that the tax changes reduced the amount of R and D performed in the United States. By 1989, these reduced private sector R and D by an estimated 100-200 percent of the additional tax revenue.

Greenwald and Stiglitz examine the likely impact of national corporate taxes. In a world without informational problems, country subsidiaries in high-tax countries theoretically would be entirely financed by debt, and those in low-tax countries would be financed by equity. As a result, national corporate income tax policies should affect the corporate investment policies of multinationals only in countries with low taxes. However, these extreme financing patterns are not observed widely. Greenwald and Stiglitz find that a model of potential partial government expropriation is more successful at explaining observed financing patterns.

Gordon and Jun examine the relative tax treatment of two alternative means by which foreign equity can be purchased: foreign direct investments (FDIs) by multinational corporations, and international equity investments by individual foreign investors. They find some tax effects on ownership patterns, which are small, perhaps in part because capital controls offset the effects of large tax distortions.

FDI in the United States boomed in the late 1980s. Some have attributed this rise to the Tax Reform Act of 1986, which, by discouraging investment by domestic firms, may have provided opportunities for foreign firms that were not as strongly affected by the U.S. tax changes. Auerbach and Hassett find instead that, while the argument applies to new capital investment, the boom was primarily in mergers and acquisitions. Although the argument holds primarily for investment in equipment, there was no shift toward the acquisition of equipment-intensive firms. Further, the FDI boom in the United States was really part of a worldwide boom in FDI: the U.S. share of outbound FDI from other countries did not increase during 1987-9.

Goodspeed, Grubert, and Swenson find that the returns of foreign-controlled companies in manufacturing increase over time, suggesting some type of start-up or maturation effect. However, declines in the dollar have depressed the earnings of foreign companies in wholesaling. Altogether, they are able to explain about half of the foreign-domestic gap in profitability, so the remainder is attributable to transfer pricing distortions or other explanations. There is also indirect evidence of transfer price manipulation, such as the persistent concentration of foreign companies close to zero taxable income.

It is often claimed that multinational firms avoid taxes by shifting income from high-tax to low-tax countries. Harris, Yeung, Mørck, and Slemrod find that U.S. tax liability, as a fraction of either of U.S. sales or assets, is related to the location of foreign subsidiaries in a way that is consistent with tax-motivated income shifting. Having a subsidiary in a tax haven such as Ireland, or one of the "four dragon" Asian countries characterized by low tax rates, is associated with lower U.S. tax ratios. Having a subsidiary in a high-tax region is associated with higher U.S. tax ratios. These results suggest that U.S. manufacturing companies shift income out of high-tax countries into the United States, and from the United States to low-tax countries. Such behavior certainly lowers worldwide tax liabilities for larger U.S. manufacturing companies and also appears to lower their U.S. tax liabilities significantly.

Altshuler and Newlon use data from 1986 corporate tax returns to investigate the extent to which U.S. corporations structure and coordinate remittances of income from their foreign subsidiaries to reduce their U.S. and foreign tax liabilities. They find that U.S. multinationals are able to take advantage of the U.S. tax system to avoid paying much U.S. tax on their foreign source income.

Wilson documents how tax and nontax considerations influence firms' location (capacity expansion) decisions and sourcing (using existing capacity) decisions. Based on interviews with nine firm managers about 68 location decisions made during the past 25 years, he finds that taxes largely dictate location decisions for business activities in which frictions are small, such as administrative and distribution centers, while

nontax considerations are very important in all *manufacturing* location decisions, including those in which the final decision is to locate in a low-tax country. Tax transfer prices do not affect performance evaluations for the sample firms, either because they use separate transfer prices for managerial and tax purposes, or because they use pretax evaluation measures that do not depend on transfer prices. Furthermore, public goods that are subsidized by taxes, such as education and transportation, weigh heavily in many location decisions. Thus, because tax rates can reflect infrastructure differences, resource allocations are not necessarily inefficient when location decisions are motivated by taxes.

Also attending the conferences were: Henri Chaoul, Jason Cummins, and Karin Lassakers, Columbia University; Michael Daly, Commission of the European Communities; Allen Frankel, Federal Reserve Board; William Gale, University of California, Los Angeles; Michael Graetz, U.S. Department of the Treasury; Douglas Holtz-Eakin, NBER and Syracuse University; Seamus O'Cleireacain, Ford Foundation; Myron S. Scholes, NBER and Stanford University; Marty Sullivan, Joint Committee on Taxation; and David Wildasin, Indiana University.

An NBER volume based on this conference is expected to be published by the University of Chicago Press. Its availability will be announced in a future issue of the *NBER Reporter*.

Retrospective on the Bretton Woods System

On October 3-6, the NBER commemorated the 20th anniversary of the end of the postwar fixed exchange rate system with "A Retrospective on the Bretton Woods System," held in New Hampshire at the site of the original conference. Some of the original attendees participated in this event. Research Associates Michael D. Bordo, Rutgers University, and Barry J. Eichengreen, University of California, Berkeley, organized the program:

Michael D. Bordo, "The Bretton Woods International Monetary System: An Historical Overview"

Discussants: Rudiger Dornbusch, NBER and MIT, and Richard Cooper, Harvard University

Alberto Giovannini, NBER and Columbia University, "Bretton Woods and Its Precursors: Rules versus Discretion in the History of International Monetary Regimes"

Discussants: Anna J. Schwartz, NBER, and Charles Wyplosz, European Institute of Business Administration

G. John Ikenberry, Princeton University, "The Political Origins of Bretton Woods"

Discussants: John Odell, University of Southern California, and Leslie S. Pressnell, London School of Economics

Maurice Obstfeld, NBER and University of California, Berkeley, "The Adjustment Process"

Discussants: Robert Z. Aliber, University of Chicago, and Vittorio U. Grilli, NBER and Yale University

Sebastian Edwards, NBER and University of California, Los Angeles, and Julio A. Santaella, University of California, Los Angeles, "The Bretton Woods System, the IMF, and Some Devaluation Controversies in the Developing Countries"

Discussants: Stanley Fischer, NBER and MIT, and Albert Fishlow, University of California, Berkeley

Panel Session I: "Perspectives of the Policymakers"
Chair: Michael L. Mussa, IMF and NBER

Panelists: Edward Bernstein, Brookings Institution; W. Max Corden, Johns Hopkins University; Robert Solomon, Brookings Institution; and Robert Triffin, Université Catholique de Louvain

Hans Genberg and Alexander Swoboda, Graduate Institute of International Studies, Geneva, "The Provision of Liquidity in the Bretton Woods System"

Discussants: Stanley Black, University of North Carolina, and John Williamson, Institute for International Economics

Kathryn M. Dominguez, NBER and Harvard University, "The Role of International Organizations in the Bretton Woods System"

Discussants: Alberto Alesina, NBER and Harvard University, and William H. Branson, NBER and Princeton University

Alan C. Stockman, NBER and University of Rochester, "Some Issues in International Transmission under Bretton Woods"

Discussants: Toru Iwami, University of Tokyo, and Bennett T. McCallum, NBER and Carnegie-Mellon University

Peter M. Garber, NBER and Brown University, "The Collapse of the Bretton Woods Fixed Exchange Rate System"

Discussants: Willem H. Buiter, NBER and Yale University, and Dale W. Henderson, Georgetown University

Richard C. Marston, NBER and University of Pennsylvania, "Interest Differentials under Fixed and Flexible Exchange Rates: The Effects of Capital Controls and Exchange Risk"

Discussants: Paul R. Krugman, NBER and MIT, and Allan Meltzer, Carnegie-Mellon University

Susan M. Collins, NBER and Harvard University, and Francesco Giavazzi, NBER and Università Bocconi, "Attitudes Towards Inflation and the Viability of Fixed Exchange Rates: Evidence from the EMS"

Discussants: Michele Fratianni, Indiana University, and Niels Thygesen, University of Copenhagen

Panel Session II: "Implications for International Monetary Reform"

Chair: Barry J. Eichengreen

Panelists: C. Fred Bergsten, Institute for International Economics; Stanley Fischer; Ronald I. McKinnon, Stanford University; and Robert Mundell, Columbia University

Bordo presents an overview of the Bretton Woods experience, analyzing its performance relative to other international monetary regimes, its origins, its operation, its problems, and its demise. Comparing the macroeconomic performance of Bretton Woods with preceding and subsequent monetary regimes reveals that, in its full convertibility phase from 1959–71, the Bretton Woods system was the most stable regime in the past century. Its stability reflected the stable financial policies of the United States as the center of the system, at least until the mid-1960s. The system, however, was short-lived because of fatal flaws in its design and the failure of the United States to maintain price stability after 1965.

Giovannini questions whether there are predictable cycles in exchange rate regimes. He evaluates a theory of the evolution of international monetary regimes, and finds that some awareness of the importance of credible rules appears to have influenced policymakers during the classical gold standard and the return to gold in the interwar years. By contrast, the IMF Articles of Agreement seem to avoid any explicit reference to rules that might prevent individual countries' inflationary policies.

Although British and U.S. officials held markedly different views during the initial negotiations for a postwar economic order, they were able to reach watershed trade and monetary agreements that set the terms for the reestablishment of an open world economy. Ikenberry attempts to explain how this settlement was reached at Bretton Woods in 1944. He argues that agreement was fostered by a community of British and American economists and policy specialists who embraced a set of policy ideas inspired by Keynesianism, and who played a critical role in defining government conceptions of postwar interests, shaping the negotiating agenda (for example, shifting the focus of negotiations from trade issues, which were highly contentious, to monetary issues, about which there was an emerging "middle ground" created by Keynesian ideas), and building coalitions in support of the postwar settlement.

According to Obstfeld, two key economic frictions impeded balance-of-payments adjustment by deficit countries during the Bretton Woods system: limited wage-price flexibility and, for much of the period, limited recourse to international credit both by individuals and by most governments. Countries with surpluses, naturally under less pressure to adjust, were able to

slow the upward adjustment of their own price levels by sterilizing reserve inflows over long periods. International credit markets evolved over time. Given other rigidities, however, imperfect government credibility with respect to exchange rates and payments barriers ensured that this evolution would undermine rather than support government attempts to adjust while maintaining fixed exchange rates. As national asset markets became more integrated after the return to convertibility in December 1958, government ministers were forced to forswear realignment ever more vigorously. These promises often were not believed, and because they were not believed, often could not be kept.

Devaluations traditionally have been traumatic episodes for developing countries. In fact, throughout the Bretton Woods system, the less developed countries vehemently opposed devaluation. Edwards and Santalla analyze the economic and political circumstances surrounding 37 major devaluations in the developing countries between 1954 and 1971, distinguishing between those that were undertaken in conjunction with IMF programs and those implemented independently. They find that these devaluations generally were the result of "fundamental disequilibria," and that countries that approached the IMF were facing deeper crises than those that did not. Additionally, countries with more unstable political systems had a higher probability of approaching the IMF. With few exceptions, the results show that these devaluation programs were successful, with the degree of success depending heavily on accompanying macroeconomic policies.

In the first panel session, Bernstein, the first research director of the IMF and an active participant in the American delegation to the July 1944 Bretton Woods Conference, reflected on the problems the IMF faced in getting started. Corden, a student of the international monetary system and advisor to the IMF, discussed the postwar concern with full employment and its effects on the design and operation of the Bretton Woods system. Solomon, a senior official in the Federal Reserve System during the heyday of Bretton Woods, reflected on the pressures in the system that led to its demise. Triffin, who in 1959 accurately diagnosed fatal flaws in the operation of Bretton Woods, presented a new insight on how the seigniorage collected by the United



Left to right: Robert Triffin, Robert Solomon, Michael L. Mussa, Edward Bernstein, and W. Max Corden.

States under the dollar standard was used to finance its fiscal deficits.

Genberg and Swoboda concentrate on the provision of international liquidity in its most frequent definition: international reserves plus the value of unconditional borrowing rights. The major source of growth of international reserves in the height of the Bretton Woods regime (1959–71) is endogenously generated foreign exchange holdings, not exogenous sources such as gold or special drawing rights. The breakdown of Bretton Woods is attributed to unwillingness to live up to the consequences and logic of the gold reserve system as it actually functioned. Inadequacy in the supply or composition of international reserves and disequilibrium dollar exchange rates are more symptoms than causes of the breakdown.

The participants at the Bretton Woods Conference created three international organizations that were intended to facilitate economic cooperation among member countries. The Bretton Woods organizations provided member countries with three types of commitment mechanisms: rules of cooperation, financial resources to enable countries to adhere to the rules, and centralized information on each others' commitment to the rules. Dominguez believes that the historical record suggests that only the latter information mechanism was used effectively by the organizations.

Policy independence attenuated the international transmission of inflation under Bretton Woods. According to Stockman, the evidence suggests that central banks had and used the ability to conduct independent monetary policies, even as they pegged exchange rates. Changes in international inflation differentials were roughly one-quarter to one-half the size of changes in money-growth differentials a few quarters earlier.

The collapse of Bretton Woods encompasses the events involved in the sequential withdrawal of convertibility of currencies into gold and the end of the unified fixed exchange rate regime from 1968 through 1973. Garber reviews the principal events and institutional changes that preceded the collapse, and then uses the theory of speculative attacks on fixed exchange rates to explain the various points of view among policymakers in the debates of the 1960s. The collapse of the gold leg of Bretton Woods was an inevitable result of the generally inflationist proclivity of the postwar system, he finds. The collapse of the fixed exchange rate leg of the system resulted from the United States's launching of an inflationary regime unacceptable to other countries in the system.

Marston considers evidence on interest differentials under the Bretton Woods system of fixed exchange rates and under the flexible rate system that succeeded it. In Britain, Germany, and the United States, capital controls resulted in large differentials between national interest rates covered for exchange risk. The capital controls and resulting differentials distorted many

cross-border investment and borrowing decisions. Marston compares these covered interest differentials with uncovered interest differentials in the Eurocurrency markets, which are free of capital controls. In both fixed and flexible periods, average uncovered differentials between Eurodollar interest rates and four other Eurocurrency rates in most cases are close to zero. Therefore, these average uncovered interest differentials, which can be attributed to exchange risk premiums and forecast errors, are much smaller than average covered interest differentials between national markets caused by capital controls.

Collins and Giavazzi provide new evidence that the recent popularity of fixed exchange rates in Europe results from a convergence in attitudes toward inflation. They use household survey data to look for shifts in attitudes toward inflation and unemployment in eight European countries during 1974–90. They find, first, that concern about inflation relative to unemployment appears to have increased significantly in both Italy and France during the sample period. Second, the United Kingdom experienced an increase in concern about inflation in the late 1980s. Perhaps this shift in attitudes was a factor in Britain's recent decision to join the exchange rate mechanism. Finally, there is a shift in the opposite direction for households in Germany: during the mid-1980s, they appear to have become *less* concerned about inflation. Interestingly, some of the small countries that stayed with Germany in the Snake—that is, Belgium, the Netherlands, and Denmark—show a similar shift. This provides a possible explanation of why Germany might be willing to stay in an exchange regime that requires it to accept a higher inflation rate.

In the second panel session, several speakers reflected on the lessons that could be learned from the Bretton Woods experience for the future design of the international monetary system. Bergsten made the case for a system of target exchange rate zones between the United States, Japan, and the European Monetary System. Fischer argued for a more active role by the IMF in restoring the economic health of Eastern Europe, in contrast to its performance in Western Europe in the immediate postwar period. McKinnon extolled the virtues of the fixed exchange rate dollar standard under Bretton Woods and argued for a return to such a system with the major countries pledging to stabilize a common international price index. Mundell reflected on the problems of the gold dollar system under Bretton Woods and alternative proposals for reform. He made a plea for a world currency and a world central bank.

Also attending the conference were: John M. Berry, *Washington Post*; Pamela Bradley, International Monetary Fund; Geoffrey Carliner, NBER; Martin Feldstein, NBER and Harvard University; June Flanders, Tel Aviv University; Jeffrey A. Frankel, NBER and University of California, Berkeley; Ikuo Hirata, *Japan Economic*

Journal; Seamus O'Cleireacain, Ford Foundation; and Michael Prowse, *Financial Times*.

An NBER volume containing these proceedings may be published by the University of Chicago Press. Its availability would be announced in a future issue of the *NBER Reporter*.

Unemployment and Wage Determination

The NBER and the Centre for Economic Policy Research (CEPR) cosponsored a conference on "Unemployment and Wage Determination" in Cambridge on October 17-18. Joseph E. Stiglitz, NBER and Stanford University, and Dennis J. Snower, CEPR and Birkbeck College, organized the following program:

Andres Rodriguez, Stanford University, and Joseph E. Stiglitz, "Unemployment and Efficiency Wages: The Adverse Selection Model"

Discussant: Andrew Weiss, Boston University

Edmund Phelps, Columbia University, "Interest and Wealth in 'Incentive Wage' Modeling of the Natural Rate of Unemployment"

Discussant: Christopher Pissarides, London School of Economics

Assar C. E. Lindbeck, University of Stockholm, and Dennis J. Snower, "Patterns of Unemployment: An Insider-Outsider Analysis"

Discussant: William T. Dickens, NBER and University of California, Berkeley

Stephen J. Nickell, Oxford University; J. Vainiomaki, University of Tampere (Finland); and Sushil Wadhvani, Goldman, Sachs & Company, "Wages, Unions, and Product Market Power"

Discussant: Mark Bills, NBER and University of Chicago

Alan Manning, London School of Economics, "Productivity Growth, Wage Setting, and the Equilibrium Rate of Unemployment"

Discussants: Mark Bills and William T. Dickens

Bruce C. Greenwald, Bell Communications Research, and Joseph E. Stiglitz, "Capital Market Imperfections and Labor Market Adjustments"

Discussant: Stephen J. Nickell

Giuseppe Bertola, NBER and Princeton University, and Ricardo Caballero, NBER and Columbia University, "Efficiency and the Natural Rate of Employment: Labor Hoarding in Matching Models"

Discussant: Bruce C. Greenwald

Olivier J. Blanchard and Peter Diamond, NBER and MIT, "Ranking, Unemployment Duration, and Wages"

Discussant: Reuben Gronau, NBER and Hebrew University

Christopher Pissarides, and Dale Mortensen, Northwestern University, "Job Creation and Job Destruction in the Theory of Unemployment"

Discussant: Giuseppe Bertola

Edmond Malinvaud, College de France, "The Segmented French Labor Market"

Discussant: Olivier J. Blanchard

William T. Dickens, and Kevin Lang, NBER and Boston University, "Labor Market Segmentation, Wage Dispersion, and Unemployment"

Discussants: Olivier J. Blanchard, and Lawrence F. Katz, NBER and Harvard University

Mark Bills, and Kenneth J. McLaughlin, University of Rochester, "Interindustry Mobility and the Cyclical Upgrading of Labor"

Discussant: Lawrence F. Katz

Edward Balls, *Financial Times*; Lawrence F. Katz; and Lawrence H. Summers, NBER and Harvard University, "Britain Divided: Hysteresis and the Regional Dimension of Britain's Unemployment Problem"

Discussant: Assar C. E. Lindbeck

Stephen J. Nickell, and Richard Layard, London School of Economics, "Unemployment in the OECD Countries"

Discussant: Assar C. E. Lindbeck

Jean-Paul Fitoussi, Observatoire Française des Conjonctures Economiques, and Edmund Phelps, "An Empirical Study on Alternative Approaches to Unemployment with a Particular Emphasis on the Role of the Real Interest Rate"

Discussant: Michael Woodford, NBER and University of Chicago

Rodriguez and Stiglitz ask how firms offering efficiency wages can improve the quality of their applicant pool. By permitting applicants to pursue only one vacancy per period, and by defining workers' reservation wages as proportional to their skills, queue length may serve as a self-selection device. A firm can measure an applicant's skills by costly testing, but faces the risk that firms that do not test will get the best applicants first.

Phelps sketches the dynamics of decisions on shirking and quitting. He finds that increases in worker wealth, with constant wages and interest rates, will increase the propensity to shirk.

Lindbeck and Snower point out that when a reduction in hiring causes both the vacancy supply and the Beveridge curves to shift, unemployment rises unambiguously while vacancies may either rise or fall. This ambiguity may explain why the vacancy and unemployment rates are correlated positively in Europe but correlated negatively in the United States.

Using data from 800 British manufacturing firms,

Nickell, Vainiomaki, and Wadhvani examine the roles of insiders and market power in wage determination. They find that firm-specific factors, such as productivity growth, do influence wage increases. There is no hard evidence on the effect of insider power on wage setting, though. Both economywide labor market conditions and product market share influence wages, with cyclical conditions of lesser importance as the firm's market power grows.

Manning examines evidence from 19 OECD countries on the link between the 1973 productivity slowdown and increases in equilibrium unemployment rates. He finds that expected fast real wage growth increases the present discounted value of having a job, giving workers strong incentives not to shirk and risk unemployment. Thus, a discrete drop in productivity growth may amount to a regime shift.

Greenwald and Stiglitz characterize the operating decisions of firms holding undiversified risk as portfolio decisions contingent on risk aversion and the "wealth" position of the firm. They define an optimal set of firm decisions designed to minimize profit variance. They then argue that firms planning layoffs should target only one segment of their workers so as not to affect the productivity of other employees.

Bertola and Caballero analyze individual firms facing idiosyncratic shocks and a costly search process to hire workers. They find that job security provisions and worker bargaining power interact with institutional factors and sectoral shocks to determine allocation, and the extent of labor hoarding.

Recognizing that firms often receive multiple applications for each vacancy, Blanchard and Diamond contrast equilibriums in which firms select workers at random and in which firms select the worker with the shortest spell of unemployment. The two equilibriums will yield different distributions of unemployment durations but identical aggregate dynamics. The authors find that the wage with ranking is much more sensitive to labor market tightness.

Pissarides and Mortensen ask what happens to firms over the business cycle. Focusing on job destruction as much as creation, the authors define each job as an irreversible investment for the firm: to alter their production mix, firms must destroy one job and create another. They then determine the price at which firms will create new vacancies.

Malinvaud suggests that temporary jobs have arisen in response to a slack labor market and a willingness of young market entrants to accept these less desirable positions when higher-wage permanent jobs are in short supply.

Dickens and Lang explain the rationing of high-wage jobs. With only one sector, workers will consider pre-announced wages to select their one application, maximizing the wage multiplied by their odds of success. In a model with two types of workers whose productivity differs only infinitesimally, firms must choose the most profitable wage-setting strategies.

Bils and McLaughlin investigate cyclical upgrading in 25 industries. They conclude that even if market clearing explains why employment is more cyclical and wages less cyclical in high-wage industries, it fails to explain the relative wage movements of those who move from job to job versus those who stay.

Balls, Katz, and Summer investigate why unemployment remains high in northern England despite the full recovery of the vacancy rate. Noting that the composition of the secondary sector has shifted from craftsman to retail and service workers, they suggest that a segmented labor market explains why the unemployed do not want the available jobs.

A long-term study of postwar unemployment in OECD countries leads Nickell and Layard to conclude that both levels of unemployment and the size of the unemployment response to shocks depend heavily on the unemployment benefit system and the wage-setting mechanisms. They also show that the impact of nominal shocks is influenced negatively by the average variance of those shocks and by the degree of nominal flexibility in wage bargaining.

Fitoussi and Phelps study the causes of prolonged high unemployment in Europe. They show that real interest rates influence unemployment, but no other variable does.

Also attending the conference were: Michael Bruno, NBER and Hebrew University; Elaine Buchberg, MIT; Geoffrey Carliner, NBER; Janet Currie, Lisa Lynch, and Julio J. Rotemberg, NBER and MIT; Sholeh Maani, University of Auckland; John Martin, OECD; Christian Schultz, University of Copenhagen; and David Stanton, Department of Employment, London.

This article was prepared with the assistance of Elaine Buchberg.

Economic Growth

Members and guests of the NBER's Project on Economic Growth met in Cambridge on October 25 and 26. Project Directors Robert J. Barro, Harvard University, and Paul M. Romer, University of California, Berkeley, organized the following program:

Paul R. Krugman, NBER and MIT, "First Nature, Second Nature, and Metropolitan Location" (NBER Working Paper No. 3740)

Discussant: Jose A. Scheinkman, University of Chicago

James E. Rauch, NBER and University of California, San Diego, "Balanced and Unbalanced Growth"

Discussant: Gene M. Grossman, NBER and Princeton University

Steven N. Durlauf, NBER and Stanford University, and Paul A. Johnson, University of Oregon, "Local versus Global Convergence in National Economies"
Discussant: Robert J. Barro

Casey B. Mulligan, University of Chicago, and Xavier Sala-i-Martin, NBER and Yale University, "Transitional Dynamics in Two-Capital-Goods Models of Endogenous Growth"
Discussant: Rodolfo E. Manuelli, NBER and Stanford University

Albert Marcet and Ramon Marmion, Universitat Pompeu Fabra, "Communication, Commitment, and Growth"
Discussant: Edward C. Prescott, NBER and University of Minnesota

Daniel Kaufmann, World Bank, "Productivity of Investment Projects"
Discussant: Angus Deaton, NBER and Princeton University

Michael Kremer, Harvard University, "The O-Ring Theory of Economic Growth"
Discussant: Sherwin Rosen, NBER and University of Chicago

Krugman develops models of spatial equilibrium in which a central "metropolis" emerges to supply manufactured goods to an agricultural "hinterland." The location of the metropolis is not determined fully by the location of resources: as long as it is not too far from the geographical center of the region, the concentration of economic mass at the metropolis makes it the optimal location for manufacturing firms.

Rauch shows why liberalization of foreign trade should lead to a transition from a lower to a higher steady-state growth rate. However, during the course of this transition, growth initially might be even slower than before liberalization. Rauch then offers a reinterpretation of the post-1973 economic performance of Chile. An application to economic integration of previously separate regions or countries suggests that the largest growth effects obtain if one region is allowed to decline and provide a source of cheap labor for the other region.

Durlauf and Johnson argue that cross-country growth is explained better by a model of local rather than global convergence. They find support for the proposition that countries converge locally, in the sense that economies with similar initial conditions tend to converge. However, they find little evidence that economies with substantially different initial conditions, as measured by per capita output or literacy rates, converge. The impact of capital formation on aggregate output increases with the level of economic development.

Mulligan and Sala-i-Martin describe necessary conditions for endogenous growth and analyze the determinants of the long-run growth rate. Economic agents will choose a larger-than-steady-state growth rate and ratio of consumption to physical capital when the physical capital is small relative to human capital. The au-

thors also show that business cycle variables need to be included in the analysis to take account of the biases introduced by technological convergence.

Marcet and Marmion compare the behavior of the economy under optimal contracts with: self-financing; external financing with complete markets in the context of full information and full enforceability; external financing with private information; and external financing with limited enforcement of debt contracts. They show that when information constraints are present, there is an efficient transfer mechanism that can be computed easily. When there is no direct disutility of labor, and when risk-averse agents have access to risk-free financial markets, information constraints affect only consumption patterns and the distribution of wealth. In contrast, commitment constraints also affect investment patterns and the growth of the economy. Marcet and Marmion conclude that the loss in growth (and utility) from commitment constraints is much higher than the loss from information constraints.

Based on the evaluation results of about 1000 World Bank projects in developing countries, Kaufmann analyzes the determinants of the productivity of investments. Countries with relatively undistorted policies are likely to end up with highly productive investments, even if policies were distorted when the project was under preparation—that is, policy changes appear to improve investment productivity, challenging the notion that fixed country-specific conditions make it impossible for many developing countries to attain high productivity. The importance of policies is evident for public as well as private sector projects, and for investments in the tradable and in the nontradable sectors.

Kremer examines production processes that consist of a series of tasks, in which mistakes can reduce the product's value dramatically. Examples abound: a space shuttle with badly designed O-rings explodes; a shirt with a carelessly sewn cuff becomes an "irregular" and sells at half price. He finds that imperfect information about worker quality can create strategic complementarity in investment in human capital, and thus can result in the possibility of multiple equilibriums in this investment. Under imperfect information, subsidies to education can enhance welfare and create multiplier effects.

Political Economy

The NBER sponsored a conference on Political Economy in Cambridge on November 15–16. Faculty Research Fellow Alberto Alesina and Morris Fiorina, both of Harvard University, and Roger Noll, Stanford University, organized the program:

Alberto Alesina; Sule Özler, NBER and University of California, Los Angeles; Nouriel Roubini, NBER

and Yale University; and Phillip Swagel, Harvard University, "Political Instability and Economic Growth"

Discussant: John Londregan, Princeton University
Roberto Perotti, Columbia University, "Income Distribution and Growth: Theory and Evidence"

Discussant: Nathaniel Beck, University of California, San Diego

Thierry Verdier and Gilles Saint-Paul, DELTA Institute, "Education, Democracy, and Growth"

Discussant: Raquel Fernandez, NBER and Boston University

Alex Cukierman, Tel Aviv University, and Bilin Neyapti and Steven Webb, World Bank, "The Measurement of Central Bank Independence and Its Effect on Policy Outcomes"

Discussant: James E. Alt, Harvard University

Kathleen Bawn, University of California, Los Angeles, "The Social Choice of Electoral Institutions: German Wahlgesetz, 1949-53"

Discussant: Kenneth A. Shepsle, Harvard University

Susan R. Smart, Indiana University, "The Policy Consequences of Appointment Methods and Party Control"

Discussant: William R. Keech, University of North Carolina

Susanne Lohmann and Sharyn O'Halloran, Stanford University, "Delegation and Accommodation in U.S. Trade Policy"

Discussant: Linda Cohen, University of California, Irvine

Geoffrey Garrett and Barry R. Weingast, Stanford University, "Ideas, Interests, and Institutions: Constructing the EC's Internal Market"

Discussant: Nouriel Roubini

Gregory Hess and Athanasios Orphanides, Federal Reserve Board, "War Politics: An Economic, Rational Voter Framework"

Discussant: Howard Rosenthal, Carnegie-Mellon University

Alesina, Özler, Roubini, and Swagel study the relationship between political instability and growth of per capita GDP in 108 countries from 1950-82. They define "political instability" as the propensity of a government to collapse. Their main result is that in countries and time periods with a high propensity of government collapse, growth is significantly lower than elsewhere. This effect remains strong when the definition of "government change" is restricted to cases of substantial change in the political orientation of the government. The authors also find that low economic growth tends to increase the likelihood of government changes, and that economic growth is not significantly different in democracies than in nondemocracies.

Perotti analyzes the impact of income distribution on growth, when investment in human capital is the

source of growth, and individuals vote on the degree of redistribution in the economy. He finds that high growth is associated with very different patterns of income distribution at different levels of per capita income.

Verdier and Saint-Paul construct a model in which redistribution, determined by a political equilibrium, is in the form of public education. Public education increases growth because it increases the level of human capital. It also produces a more even income distribution. At given levels of political rights, more inequality may stimulate growth if it implies more political support for education, they find. Increased political rights increase growth and also imply a more nearly equal income distribution. Growth and inequality tend to decrease along the convergence path in the absence of political or distributional shocks.

Cukierman, Neyapti, and Webb measure central bank independence (CBI) for a sample of up to 70 countries between 1950 and 1989. They examine measures of legal independence; the turnover of central bank governors; and variables derived from a questionnaire on CBI for the 1980s. The authors find that inflation is related to legal independence in developed countries and to governors' turnover in less developed countries. Also, there is a two-way causality between inflation and CBI. Legal limitations on government's borrowing from the central bank are not adhered to closely. Finally, higher turnover of parties in office within a given political system leads to higher legal independence, but greater instability of the system leads to lower legal independence.

Bawn analyzes the choice of an electoral system in Germany after World War II. She notes that parties choose electoral institutions that maximize their future policy influence, and that this explains both the adoption of proportional representation in 1949 and the switch to a two-vote ballot in 1953. She finds that the balance of power induced by existing institutions was preserved in the new institutional choice.

Smart studies the effect of political institutions on regulatory outcomes. Since the introduction of pro-competitive federal policies in telecommunications, major differences in the policies of state regulators have emerged. Smart finds that different methods for selecting state public utility commissioners can explain differences in the relative influence of the executive and legislative branches over commissioners.

Lohmann and O'Halloran model delegation and accommodation in U.S. trade policy. While levels of protection are lower when the president controls trade policy, a constrained president implements more protectionist trade policy measures than an unconstrained one. For 1950-88, after controlling for the effect of changes in economic conditions, Lohmann and O'Halloran find that U.S. trade policy has been less protectionist when the same party controlled both White House and Congress than when control was divided.

Garrett and Weingast note that the European Community's (EC's) post-1985 internal market cannot be

explained well by conventional theories of international cooperation. Two types of ambiguities make it unlikely that cooperation will "evolve" through the mechanisms of repeated play, retaliation, and reputation alone. First, members may disagree about what behaviors constitute compliance with internal market rules. Second, the rules of the market may be unclear for specific cases unforeseen by members at the formation of the market. The idea of "mutual recognition" played a critical role in the negotiations over the definition of compliance and defection in the internal market. The "direct effect" of EC law in national jurisdictions, and its "supremacy" over domestic laws, are central to the effective application of the general principles of the internal market.

Hess and Orphanides find that U.S. presidents are more likely to begin foreign conflicts during their first term if the economy is in recession than during other periods. They theorize that if a leader's ability to wage war and his competence in handling the economy jointly determine voter preferences, then an incumbent leader with an unfavorable economic record may initiate a war to dramatize his leadership abilities and thus to salvage his reelection. Surprisingly, this result obtains despite voter rationality and informational symmetry.

Also attending the conference were: Abhijit Banarjee, Princeton University; Olivier J. Blanchard, NBER and MIT; Michael Bruno, NBER and Hebrew University; Geoffrey Carliner, NBER; Gerald D. Cohen, Alan Gerber, Michael Gilligan, and Joseph P. Kalt, Harvard University; J. Bradford De Long, Elhanan Helpman, and Richard J. Zeckhauser, NBER and Harvard University; Herschel I. Grossman, NBER and Brown University; Douglas A. Hibbs, Jr., Trade Union Institute for Economic Research; Richard Rogerson, NBER and University of Minnesota; Ron Schachar, Tel Aviv University; and Charles Stewart, MIT.

Tax Policy and the Economy

The NBER's Sixth Annual Conference on "Tax Policy and the Economy" was held in Washington on November 19. The program was organized by NBER Tax Program Director James M. Poterba of MIT. Five papers were discussed:

Steven F. Venti, NBER and Dartmouth College, and David A. Wise, NBER and Harvard University, "Government Policy and Personal Retirement Saving"

James M. Poterba, "Corporate Tax Revenues Since the Tax Reform of 1986: What Explains the Shortfall?"

Lawrence H. Goulder, NBER and Stanford University, "The Distribution of Industry Burdens from Carbon Taxes"

Joel B. Slemrod, NBER and University of Michigan, "Taxation and Inequality: A Time Exposure Perspective"

Alan J. Auerbach, NBER and University of Pennsylvania; Jagadeesh Gokhale, Federal Reserve Bank of Cleveland; and Laurence J. Kotlikoff, NBER and Boston University, "Social Security and Medicare Policy from the Perspective of Generational Accounting" (NBER Working Paper No. 3915)

Venti and Wise review the data on IRAs and saving in new ways, and confirm their earlier findings that IRAs represent new saving. While IRA saving increases with age and income, it is fairly widespread: they find, for example, that more than half of IRAs in 1986 were held by families with incomes of \$50,000 or less. Further, from 1980-9, saving outside of IRAs held fairly stable, as IRA saving first rose and then, after the 1986 tax changes, fell.

The Tax Reform Act of 1986 was projected to raise corporate taxes by more than \$120 billion during 1986-91, but actual federal corporate tax receipts have fallen far short of those projections. Poterba finds that the most important factor contributing to this shortfall is lower-than-expected corporate profits. There are three principal causes of the underperformance of corporate profits: a lower-than-expected return on corporate capital; an increase in interest payments as a share of corporate operating income; and an increase in income to Subchapter S corporations subject to the individual income tax.

Goulder examines the effects of a U.S. carbon tax on U.S. industries. He considers alternative tax designs that differ according to the tax treatment of internationally traded goods and the use of tax revenues. Goulder finds that the decline in profits and output for most affected industries is much lower when the tax is based on carbon emissions associated with the consumption or use of fuels than when it is based on emissions associated with the production or supply of fuels. A tax on domestic production and on a selected number of carbon-intensive imports has little effect on international competitiveness and avoids the substantial administrative costs of a carbon tax based on use. Using carbon tax revenues to finance cuts in preexisting distortionary taxes reduces, but does not eliminate, the adverse consequences of the carbon tax policy for industry profits and investment, Goulder concludes.

Slemrod notes that most estimates of trends in income inequality, and the role of the tax system, have been based on cross-sectional snapshots of annual income. Yet conclusions based on snapshots can give a misleading picture. Therefore, to reassess some of the conclusions about taxation and inequality, he uses tax return data that has extensive information on property income, and in particular data on an unchanging sample of taxpayers from 1979 to 1986, and a distinct set of taxpayers from 1967 to 1973. He finds that 16 percent of the increase in one measure of inequality—

the Gini coefficient—was caused by changes in federal policy. Taxes have increased the trend toward inequality slightly in the 1980s, he concludes.

Auerbach, Gokhale, and Kotlikoff revisit their concept of “generational accounting,” a method of determining how the burden of fiscal policy falls on different generations. In this paper, they simulate the effects of realistic paths for Social Security and Medicare. They conclude that if the accumulation of a Social Security trust fund does not continue, or if Medicare costs rise as a share of GNP, then the unbalance in generational policy could greatly increase. Future generations, and current young Americans, would pay significantly more to the government. For example, continued expansion of Medicare in this decade alone could double the 21 percent imbalance between current and future generations if the bill for this Medicare growth is shifted primarily to future generations.

A conference volume will be published by the MIT Press; its availability will be announced in a future issue of the *NBER Reporter*.

Economics of the Environment

Over 70 economists gathered in Cambridge on December 13 and 14 for an NBER–Universities Research Conference on “Economics of the Environment.” R. Glenn Hubbard, on leave from the NBER at the U.S. Department of the Treasury, and Jeffrey K. MacKie-Mason, NBER and University of Michigan, organized the program:

Robert Hahn, Carnegie–Mellon University, “Government Markets and the Theory of the Nth Best”

Discussants: Gunnar Eskeland, World Bank, and Martin Weitzman, Harvard University

Adam Jaffe, NBER and Harvard University, and Robert Stavins, Harvard University, “The Energy Paradox and the Diffusion of Conservation Technology”

Discussants: Sharon Oster, Yale University, and Ariel Pakes, NBER and Yale University

Trudy Ann Cameron, University of California, Los Angeles, and Jeffrey Englin, University of Nevada, Reno, “Cost–Benefit Analysis for Nonmarket Resources under Individual Risk”

Discussants: Stephen Berry, NBER and Yale University, and Lawrence H. Goulder, NBER and Stanford University

V. Kerry Smith and Ju Chin Huang, North Carolina State University, “Can Hedonic Models Value Air Quality? A Meta-Analysis”

Discussants: Myrick Freeman, Bowdoin College, and Thomas Tietenberg, Colby College

Dinner Speaker: Thomas Barthold, U.S. Congress Joint Committee on Taxation, “Issues in the Design of Environmental Excise Taxes”

Kevin Hassett, Columbia University, and Gilbert E. Metcalf, NBER and Princeton University, “Residential Energy Tax Credits and Home Improvement Behavior”

Discussants: Jeffrey Dubin, California Institute of Technology, and Dennis Epple, Carnegie–Mellon University

Margaret Walls, Resources for the Future, “Differentiated Products and Regulation: The Welfare Costs of Natural Gas Vehicles”

Discussants: James A. Levinsohn, NBER and University of Michigan, and Martin Zimmerman, Ford Motor Company

Gene M. Grossman and Alan B. Krueger, NBER and Princeton University, “Environmental Impacts of a North American Free Trade Agreement” (NBER Working Paper No. 3914)

Discussants: Robert Crandall, Brookings Institution, and Maureen Cropper, University of Maryland

Hahn provides some general guidelines for the organization of government markets in property rights, to allocate such resources as landing rights and environmental quality. He examines the problem of devising such markets when there are multiple inputs to the production process that are subject to different taxes and regulations. Finally, he analyzes how some simple rules can be applied to problems involving regulated utilities.

Jaffe and Stavins ask what factors determine the rate of adoption of energy-conserving technologies, and how relatively effective prices and regulations are in encouraging such adoption. They develop models that allow for information problems, principal/agent slippage, unobserved costs, learning effects, high discount rates, and heterogeneity among potential adopters of energy-conserving technology. Then they model the adoption decisions associated both with new home construction and with retrofitting existing houses.

Cameron and Englin develop an empirical model of consumer decisionmaking and apply it to paying for prevention of acid rain damage to lakes in the northeastern United States. They use responses to a contingent valuation survey to derive values for individual expected consumer surplus, option price, option value, and individual willingness to pay. They estimate that the median respondent would be willing to pay over \$200 to “save” lakes in New England.

Smith and Huang evaluate the performance of hedonic property value models involving air pollution. They find that the air qualities of the cities being studied and the economic conditions in local housing markets both influence the ability of hedonic models to detect significant linkages between pollution and property values.

Barthold reviewed the history of environmental ex-

cise taxation in the United States and surveyed the current environmental excise taxes in force. Much of the existing economic literature addresses only the goal of economic efficiency, within the context of identifying the efficient rate of tax, without discussing the choice of tax base or taxpayer. Barthold illustrated the design and political obstacles that arise in crafting environmental excise taxes when he discussed the recently enacted tax on ozone-depleting chemicals and the proposed taxes on virgin materials.

Hassett and Metcalf use data from roughly 38,000 individual income tax returns from 1979-81 and find that increasing the energy tax credit by 10 percentage points would increase the percentage of households claiming the credit from 5.4 percent to 6.7 percent.

Walls develops a method for quantifying the costs to consumers of compressed natural gas (CNG) automobiles. CNG vehicles require very large, heavy cylinders to store the fuel at a pressure high enough to provide a satisfactory energy content. This added weight and bulk increases acceleration time and usually reduces cargo capacity. Walls compares this loss to the gains from CNG vehicles in terms of health benefits from improved air quality. The loss appears to be greater than the benefits, but may not be too far out of line with alternative ways to reduce emissions.

In anticipation of further trade liberalization with Mexico, Grossman and Krueger study the relationship between air quality and economic growth. They find that for two pollutants, sulfur dioxide and smoke, concentrations increase with per capita GDP at low levels of national income, but decrease with GDP growth at higher levels of income. The turning point comes at about \$5000. They also predict that trade liberalization will cause the utilities sector in Mexico to contract. Since this sector generates many air pollutants, a North American Free Trade Agreement might improve air quality. Also, the predicted change in the structure of Mexican manufacturing suggests that production of toxic waste may decline.

International Comparisons of Private Sector Training

The NBER and the Centre for Economic Performance, London School of Economics, jointly sponsored a conference on "International Comparisons of Private Sector Training" in London on December 16 and 17. The program, organized by NBER Faculty Research Fellow Lisa M. Lynch of MIT, was:

John Bishop, Cornell University, "The Impact of Previous Training in Schools and on Jobs on Productivity, Required OJT, and Turnover of New Hires"

Discussant: Anders Bjorklund, Swedish Institute for Social Research

Andrew M. Weiss, Boston University, "Productivity Changes Without Formal Training"

Discussant: Alison Booth, Birkbeck College

Stephen V. Cameron, University of Chicago, and James J. Heckman, NBER and University of Chicago, "The Determinants and Outcomes of Post-Secondary Training: A Comparison of High School Graduates, Dropouts, and High School Equivalents"

Discussant: Stephen J. Nickell, Oxford University

David G. Blanchflower, NBER and Dartmouth College, and Lisa M. Lynch, "Training at Work: A Comparison of U.S. and British Youths"

Discussant: Peter Elias, Warwick University

Peter Dolton, University of Newcastle Upon Tyne; Gerald Makepeace, University of Hull; and John Treble, University of Essex, "Vocational Training in the Early Careers of British School Leavers"

Discussant: Wim Groot, Leiden University

David Soskice, Wissenschaftszentrum Berlin für Sozialforschung, "The German Training System: Reconciling Markets and Institutions"

Discussant: Hilary Steedman, National Institute of Economic and Social Research

Peter Berg, University of Notre Dame, "Strategic Adjustments in Training: A Comparative Analysis of the U.S. and German Automobile Industries"

Discussant: Richard Disney, University of Kent

Masanori Hashimoto, Ohio State University, "Employment-Based Training in Japanese Firms in Japan and in the United States"

Discussant: Mari Sako, London School of Economics

Using two U.S. employer surveys, Bishop identifies the impact of employer-provided training on the productivity and labor turnover of new hires. He finds higher productivity and lower training costs among employees trained in private vocational/technical rather than similar public institutions. Specifically, these new hires on average have a 22 percent higher overall productivity, net of training costs, during their first three months of employment.

Weiss examines the productivity changes associated with informal training. Using unique and detailed information on four groups of semiskilled production workers in the United States, he concludes that learning-by-doing is not an important determinant of productivity changes.

Cameron and Heckman consider the difference in the patterns of skill development for high school graduates, high school dropouts, and dropouts who later obtain high school equivalency through General Educational Development (GED) exams. Specifically, they show that high school graduates do better than GED youths in terms of hours, wages, and weeks worked. However, the GED is useful in getting some of these youths into private sector training.

Blanchflower and Lynch analyze the skill development pattern for youths in the United States and Great Britain who are not university graduates. They show that the incidence of training for these types of workers is much higher in Britain than in the United States. The key feature to training in Britain is certification through exams that are recognized nationally. Blanchflower and Lynch also show that, with recent changes in British training policy, the link between post-school training and qualifications seems to have been broken.

Dolton, Makepeace, and Treble continue the discussion on post-school training in Great Britain and examine the returns to the new government-led Youth Training Program. Their work indicates that the returns to this new type of training are lower than the returns associated with the previous apprenticeship programs examined by Blanchflower and Lynch.

Soskice analyzes how the German system of education and training works in the context of market and institutional forces. He describes three critical institutions that result in higher skills development in Germany than elsewhere: the long-term relationships of banks with firms; the role of works councils in negotiating conditions of training at the local level; and employer associations and local chambers of commerce providing external expertise in establishing and monitoring employer training.

Berg presents a detailed case study of the training practices in 18 German and U.S. auto plants. He documents the difference in the number of hours and the training content of workers in similar occupations in the two countries.

Hashimoto contrasts the training practices of Japanese auto manufacturers with plants in the United States and Japan. He contends that the different labor market practices in training between Japan and the United States reflect differences in the investment made in the employment relationship. Specifically, he argues that Japanese firms can offer more training in Japan because the costs are lower: Japanese workers have already acquired "citizenship" skills in school, and on the Japanese shop floor there is an emphasis on teamwork and problem-solving.

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

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 Spring 1992 issue of the *Reporter* is March 1. If you have any questions about procedures for submitting materials for the calendar, please call Kirsten Foss Davis at (617) 868-3900.

January 31, 1992

Program Meeting: Corporate Finance, NBER

February 7, 1992

Economic Fluctuations Research Meeting, NBER

February 7-8, 1992

Export Market Access, NBER

February 8, 1992

Workshop on Impulses and Propagation Mechanisms, NBER

February 9, 1992

Micro and Macro Perspectives on the Aggregate Labor Market, NBER

February 12-15, 1992

Second U.S.-Japan Economic Forum, NBER

February 21, 1992

Behavioral Finance, NBER

February 26-29, 1992

Industrial Restructuring in Eastern Europe, NBER

February 28, 1992

Program Meeting: Monetary Economics, NBER

March 6-7, 1992

Seventh Annual Conference on Macroeconomics, NBER

March 13, 1992

Program Meeting: Productivity, NBER

March 20, 1992

Program Meeting: Asset Pricing, NBER

March 20-21, 1992

Economic Consequences of the East, Centre for Economic Policy Research

March 26-28, 1992

Annual Meeting, Midwest Economic Association*

March 27-28, 1992

Financial Intermediation in the Construction of Europe, Centre for Economic Policy Research

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

April 2-3, 1992
Program Meeting: Taxation, NBER

April 2-3, 1992
Panel on Economic Activity: Macroeconomics, Brookings Institution

April 2-3, 1992
Economic Policy Panel, Centre for Economic Policy Research

April 2-5, 1992
Japan and the United States in Pacific Asia, NBER

April 3-4, 1992
Economic Growth, NBER

April 10-11, 1992
Universities Research Conference on Labor Studies, NBER

April 24, 1992
Workshop on Macroeconomic History, NBER

April 24-25, 1992
Public Policy Conference, Carnegie-Mellon University—University of Rochester

May 7-10, 1992
Conference on Aging, NBER

May 8, 1992
Program Meeting: Industrial Organization, NBER

May 8-10, 1992
Fifth InterAmerican Seminar on Economics, NBER

May 15, 1992
Foreign Direct Investment, NBER

June 5, 1992
Conference on Research in Income and Wealth: Workshop on Measurement of Depreciation and Capital Stock, NBER

June 11-13, 1992
Transatlantic Public Economics Symposium, NBER

June 15-16, 1992
International Seminar on Macroeconomics, NBER (with the European Economic Association and La Maison des Sciences de l'Homme)

June 16-20, 1992
Third Annual Asian Seminar on Economics, NBER (with Korea Development Institute)

July 9-13, 1992
Sixty-Seventh Annual Conference: "The Expanding Domains of Economics, Western Economic Association"

September 15-18, 1992
Annual Meeting, National Association of Business Economists*

September 17-18, 1992
Panel on Economic Activity: Macroeconomics, Brookings Institution

October 30-31, 1992
Economic Growth, NBER

November 5-6, 1992
Growth and Stabilization in Latin America, NBER (with InterAmerican Development Bank)

November 12-13, 1992
Program Meeting: Taxation, NBER

November 17, 1992
Tax Policy and the Economy, NBER

November 22-24, 1992
Annual Meeting, Southern Economic Association*

December 4-5, 1992
International Savings, NBER

September 19-23, 1993
Annual Meeting, National Association of Business Economists*

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

Bureau News

New Bureau Programs

This fall, the NBER's Program on Financial Markets and Monetary Economics was divided in three. The new Program on Asset Pricing, directed by John Y. Campbell of Princeton University, will examine sources of fluctuations in the prices of assets such as stocks, bonds, and foreign currency. The Program on Monetary Economics will study the mechanisms, effects, and determinants of monetary policies, both in the United States and in other countries. Benjamin M. Friedman is the director and N. Gregory Mankiw the associate director of that program; both are at Harvard University. The Program on Corporate Finance, directed by Robert W. Vishny of the University of Chicago, will concentrate on the causes and effects of financing arrangements used by corporations.

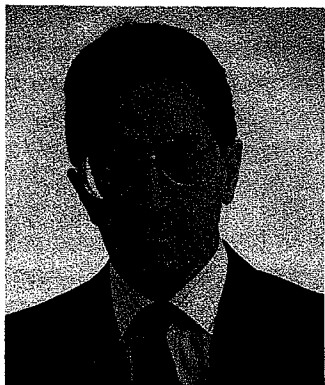
Nancy L. Rose of MIT initiated a new Program on Industrial Organization, which she will direct. She and the program's other members will conduct empirical analyses of firm behavior and government regulation.

Finally, the NBER's international studies program, currently directed by William H. Branson of Princeton University, has two new associate directors: Robert C. Feenstra, of the University of California, Davis, will oversee the group dealing with International Trade and Investment, while Jeffrey A. Frankel, of the University of California, Berkeley, will be responsible for activities in International Finance and Macroeconomics.

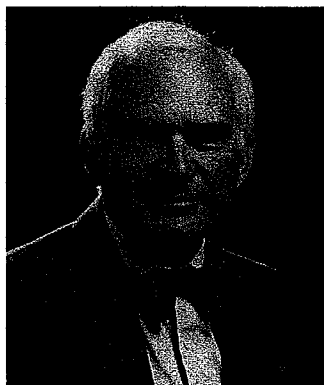
**Open conference, subject to rules of the sponsoring organization.*

New Directors Named

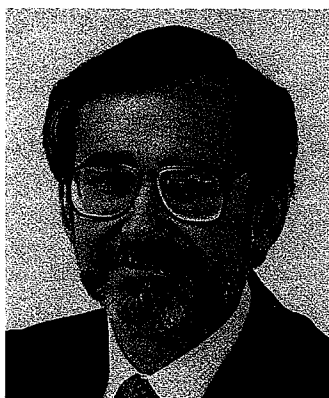
Three new directors were elected at the fall meeting of the NBER Board: Marcel Boyer, Don R. Conlan, and Charles A. Lave.



Marcel Boyer



Don R. Conlan



Charles A. Lave

Marcel Boyer, representing the Canadian Economics Association, is a professor of economics at the University of Montreal. He received a Ph.D. in economics from Carnegie-Mellon University.

Don Conlan, an at-large member of the Board, is president and director of The Capital Group, Inc., a Los Angeles-based investment management organization that he joined in 1974. He holds a B.B.A. and an M.B.A. in finance and business economics from the University of Michigan.

Charles Lave, who represents the American Economic Association, is a professor of economics and chairs that department at the University of California, Irvine. He received his Ph.D. in economics from Stanford University.

1992-3 Olin Fellows

The NBER Olin Fellows for 1992-3 are Janet Currie and Sergio Rebelo. The Fellows program is supported by a grant from the John M. Olin Foundation.

Currie will investigate the relationship between transfer programs and the welfare of children. She also will study the relationship between occupational segregation and the structure of fringe benefits.

Currie received her Ph.D. from Princeton University in 1988 and became an NBER faculty research fellow in 1991. She teaches economics at MIT.

Rebelo will analyze the effect of taxation and other government policies on long-run economic growth. He also will examine the causes of business fluctuations, including productivity shocks and government spending.

Rebelo received his Ph.D. from the University of Rochester in 1987, and has been an NBER faculty research fellow since 1991. Rebelo has taught at Northwestern University's Kellogg School of Management, and will join the faculty of the University of Rochester after his year as an Olin Fellow.

Senate Confirms NBER Researchers

The U.S. Senate recently confirmed the appointments of two former NBER researchers. On November 7, David F. Bradford officially became a member of the President's Council of Economic Advisers. Before going to Washington, Bradford was a professor at Princeton University and director of the NBER's Program in Taxation.

On November 22, Lawrence B. Lindsey became the newest governor of the Federal Reserve Board. He had been a member of the economics faculty at Harvard University and was associated with the NBER's Program in Taxation.

Griliches Is AEA President-Elect

Zvi Griliches, director of the NBER's Program in Productivity since 1978, is president-elect of the American Economic Association. Nominated in March 1991 and confirmed in September, Griliches will assume the presidency in 1993. He will be responsible for organizing the AEA's January 1993 meeting in Anaheim and will deliver the presidential address there.

Griliches is the Nathaniel Ropes Professor of Political Economy at Harvard. He was awarded the AEA's prestigious John Bates Clark Medal in 1965 and was elected to the National Academy of Sciences in 1975.

de Macedo Named Finance Minister

Jorge Braga de Macedo, who has been associated with the NBER's Program in International Studies since 1981, has been appointed Finance Minister of Portugal. Most recently, he had been Director of National Economies at the Commission of the European Communities in Brussels.

de Macedo was educated at the University of Toulouse and the University of Portugal before receiving his Ph.D. in economics from Yale University in 1979. He has taught at the New University of Lisbon, the Catholic University of Portugal, Princeton University, and Yale University.

NBER Mourns Stigler

Nobel Laureate George J. Stigler died in Chicago on December 1 at age 80. Stigler, who received the prize in 1982 for his work on regulation, was a member of the Bureau's research staff in the 1940s and 1950s while teaching at Columbia University. He was the author or editor of seven NBER volumes, most of which focused on employment issues.

Stigler held a B.B.A. from the University of Washington, an M.B.A. from Northwestern University, and a Ph.D. from the University of Chicago. He taught at the University of Iowa, University of Minnesota, Columbia University, and Brown University, before beginning his 32-year tenure at the University of Chicago in 1958.

Economic Fluctuations Research Meeting

Over 60 members and guests of the NBER's Program in Economic Fluctuations met in Cambridge on October 11. Faculty Research Fellows Laurence Ball, Princeton University, and Robert B. Barsky, University of Michigan, organized the following program:

Christopher D. Carroll, Federal Reserve Board, "Buffer Stock Saving and the Permanent-Income Hypothesis"

Discussant: Miles S. Kimball, NBER and University of Michigan

William C. Brainard and William Nelson, Yale University, and Matthew D. Shapiro, NBER and University

of Michigan, "The Consumption Beta Explains Expected Returns at Long Horizons"

Discussant: N. Gregory Mankiw, NBER and Harvard University

James A. Kahn, University of Rochester, "Why Is Production More Volatile Than Sales? Theory and Evidence on the Stockout-Avoidance Motive for Inventory-Holding"

Discussant: Kenneth D. West, NBER and University of Wisconsin, Madison

Chinhui Juhn, University of Houston, and Kevin M. Murphy and Robert H. Topel, NBER and University of Chicago, "Unemployment, Nonemployment, and Wages: Why Has the Natural Rate Increased Through Time?"

Discussant: John Bound, NBER and University of Michigan

Anil K. Kashyap, University of Chicago; Jeremy C. Stein, NBER and MIT; and David W. Wilcox, Federal Reserve Board, "Monetary Policy and Credit Conditions: Evidence from the Composition of External Finance"

Discussant: Ben S. Bernanke, NBER and Princeton University

George W. Evans, London School of Economics, and Garey Ramey, University of California, San Diego, "Expectation Calculation, Hyperinflation, and Currency Collapse"

Discussant: Michael Woodford, NBER and University of Chicago

Carroll uses the Panel Survey of Income Dynamics to estimate the degree of uncertainty in individual income, and how it fits into a standard version of the life-cycle model. The standard model predicts unrealistically high saving rates for precautionary reasons, but if its assumptions are modified to allow consumers to be more impatient and less risk averse, then most saving is done to buffer short-horizon shocks to income. Carroll argues that this buffer-stock model of saving is consistent with a broad range of evidence unexplained by the standard life-cycle/permanent-income model.

Brainard, Nelson, and Shapiro discuss a class of alternatives in which the consumption-based asset pricing models are likely to hold better at low frequencies than at high frequencies. They apply this analysis to the consumption beta model, in which the risk premium for holding an asset is proportionate to the covariability of its return with aggregate consumption growth. Their results show that, at long horizons, the consumption beta model fits the data on returns to financial assets well.

Kahn derives empirical implications of the "stockout-avoidance" model of inventory behavior, and then tests them on data from the automobile industry. His results largely support the model. Subsidiary evidence on the relative variance of demand and cost shocks suggests that demand shocks are more important.

Juhn, Murphy, and Topel show that virtually all of the trend toward rising joblessness in the United States in the recent past can be explained by rising unemployment and nonparticipation in the labor force among the less skilled. For these groups, increases in weeks without employment are mainly attributable to increases in the incidence of very long spells of unemployment. The authors also find that the natural rate of unemployment varies with labor market conditions. A long-run decline in the demand for various types of labor may increase the natural rate, because the rewards to employment decline for marginal workers.

Kashyap, Stein, and Wilcox find that tighter monetary policy leads to a shift in firms' mix of external financing: commercial paper issuance rises while bank loans fall, suggesting that loan supply indeed has been reduced. Furthermore, these shifts in the financing mix seem to affect investment (even after controlling for interest rates). This implies that for businesses, bank and nonbank sources of finance are not perfect substitutes. This view of the transmission mechanism can help to explain why interest rate spreads involving commercial paper rates have had considerable predictive power for many measures of economic activity.

Evans and Ramey develop a framework that endows agents with a technology for calculating expectations. Expectations are determined by balancing the costs and benefits of calculation. Hyperinflationary episodes involving accelerating inflation and terminating in currency collapse arise naturally.

Monetary Economics Program Meets

The NBER's Program on Monetary Economics had its inaugural meeting on November 1. Program codirectors Benjamin M. Friedman and N. Gregory Mankiw, both of Harvard University, organized the following agenda:

John C. Driscoll, Harvard University, and James M. Poterba and Julio J. Rotemberg, NBER and MIT, "Money, Output, and Prices: Evidence from a New Monetary Aggregate" (NBER Working Paper No. 3824)

Discussant: James H. Stock, NBER and Harvard University

Laurence M. Ball, NBER and Princeton University, "Disinflation with Imperfect Credibility"

Discussant: Bennett T. McCallum, NBER and Carnegie-Mellon University

David H. Romer, NBER and University of California, Berkeley, "Openness and Inflation: Theory and Evidence"

Discussant: Robert J. Barro, NBER and Harvard University

Ben S. Bernanke, NBER and Princeton University, and Cara Lown, Federal Reserve Bank of New York, "The Credit Crunch"

Discussant: Jeffrey A. Miron, NBER and Boston University

Mark Gertler, NBER and New York University, and Simon Gilchrist, Federal Reserve Board, "Monetary Policy, Business Cycles, and the Behavior of Small Manufacturing Firms" (NBER Working Paper No. 3892)

Discussant: Mark Goodfriend, Federal Reserve Bank of Richmond

Driscoll, Poterba, and Rotemberg develop a new monetary aggregate, the currency-equivalent aggregate, equal to the stock of currency that households would require to obtain the same liquidity services that they get from their entire collection of monetary assets. The authors compare the ability of the new aggregate and conventional aggregates, such as M1 and M2, and other indicators of monetary policy, to forecast real activity. Their currency-equivalent aggregate has more predictive power for output and prices than standard aggregates do, and the time path of the estimated response of output is more consistent with broad classes of models.

With staggered price adjustment, a quick disinflation raises output if it is fully credible. If credibility is imperfect and price adjustment is synchronized, announced disinflations are neutral on average. Ball shows, however, that a combination of imperfect credibility and staggered adjustment can explain the contractionary effects of disinflation.

Romer notes that unanticipated monetary expansion leads to depreciation of the real exchange rate, and the harms of real depreciation are greater in more open economies. Thus, under discretionary policymaking, money growth and inflation will be lower in more open economies. Using cross-country data, Romer finds a strong negative link between openness and inflation.

Bernanke and Lown find that bank lending *has* been weak in the 1990 recession, even relative to previous recessionary periods. This weakness has been most pronounced in the Northeast, although it is not confined to that region. Demand factors, including the weakened state of borrowers' balance sheets, very well could explain much of the weakness. Bernanke and Lown also argue, however, that a shortage of equity capital has limited banks' ability to make loans. But they do not find that the credit crunch played a major role in worsening the 1990 recession.

Gertler and Gilchrist find that, for more than two years following tight money, the sales of small firms

decline at a faster pace than sales of large firms. Further, bank lending to small firms contracts, while it actually rises for large firms. Monetary policy indicators, such as M2, tied to the performance of banking, have relatively greater predictive power for small firms than for large. Finally, small firms are more sensitive than large firms to lagged movements in GNP.

Also attending the conference were: Andrew B. Abel and Stephen P. Zeldes, NBER and University of Pennsylvania; Robert B. Barsky, NBER and University of Michigan; Olivier J. Blanchard, NBER and MIT; Michael D. Bordo, NBER and Rutgers University; Willem H. Buiter, NBER and Yale University; Geoffrey Carliner and Anna J. Schwartz, NBER; Stephen G. Cecchetti, NBER and Ohio State University; J. Bradford De Long, Martin Feldstein, and Kenneth A. Froot, NBER and Harvard University; Herschel I. Grossman, NBER and Brown University; David Johnson, Wilfrid Laurier University; Frederic S. Mishkin, NBER and Columbia University; and Richard Syron, Federal Reserve Bank of Boston.

Program Meeting on Taxation

About 40 members and guests of the NBER's Program in Taxation met in Cambridge on November 7 and 8. David F. Bradford, currently on leave at the President's Council of Economic Advisers, and Program Director James M. Poterba, MIT, organized the following program:

James M. Poterba, "House Price Dynamics: The Role of Tax Policy and Demography"

Discussant: Patric H. Hendershott, NBER and Ohio State University

Jonathan S. Skinner, NBER and University of Virginia, and Eric Engen, University of California, Los Angeles, "Fiscal Policy and Economic Growth"

Discussant: J. Bradford De Long, NBER and Harvard University

Douglas Holtz-Eakin, NBER and Syracuse University; Harvey S. Rosen, NBER and Princeton University; and David Joulfaian, U.S. Department of the Treasury, "Entrepreneurial Decisions and Liquidity Constraints"

Discussant: Joseph E. Stiglitz, NBER and Stanford University

Janet Currie, NBER and MIT, and Nancy Cole, University of California, Los Angeles, "Does Participation in Transfer Programs During Pregnancy Improve Birthweight?" (NBER Working Paper No. 3832)

Discussant: Henry Aaron, Brookings Institution

Timothy Besley and Anne C. Case, NBER and Princeton University, "Incumbent Behavior: Vote Seeking, Tax Setting, and Yardstick Competition"

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

R. Glenn Hubbard, NBER and Columbia University, and Charles W. Calomiris, Northwestern University, "Tax Policy, Internal Finance, and Investment: Evidence from the Undistributed Profits Tax of 1936-7"

Discussant: David M. Cutler, NBER and Harvard University

Poterba finds that the patterns of *relative* change in house prices during the late 1970s and mid-1980s are consistent with the importance of real user costs. More expensive homes appreciated by more in the 1970s than their less expensive counterparts, consistent with the larger reduction in user cost for high-income households. Poterba's data do not support the role of anticipated demographic changes in explaining house price changes. Further, house prices do not appear to be set in an efficient asset market. Changes in individual cities can be predicted partially on the basis of lagged information about changes in per capita income and house prices in that city.

Skinner and Engen develop a model of fiscal policy and output growth that allows for effects of government spending on private productivity, increasing or decreasing returns to scale, a transition path away from the equilibrium growth path, and static tax distortions. Using data from 107 countries during 1970-85, and correcting for the potentially serious problem of endogeneity in government policy, the authors find that a balanced-budget increase in government spending and taxation reduces rates of output growth.

Entrepreneurs are regarded as valuable sources of innovation, employment, and economic dynamism. Some policies to encourage entrepreneurship are advocated in the belief that capital market imperfections restrict entrepreneurs' access to financing. If so, entrepreneurship may be strongly influenced by the personal wealth of the individual. Holtz-Eakin, Rosen, and Joulfaian find that an inheritance (or "windfall" of wealth) has little effect on the probability of starting a business, but does increase capital investment and debt finance by start-ups.

Currie and Cole examine the relationship between a mother's participation during her pregnancy in Aid to Families with Dependent Children, the Food Stamp Program, and/or housing assistance, and one of the least controversial measures of child welfare: the birthweight. They do not find a statistically significant relationship.

Besley and Case show that using the tax policy of neighboring jurisdictions to evaluate the performance of incumbent politicians makes voters more tolerant of high taxes and has implications for the tax-setting process. Their results confirm the importance of neighbors' taxes both on the probability of incumbent reelection and on tax-setting behavior.

Hubbard and Calomiris use a tax experiment, the Surtax on Undistributed Profits (SUP) in the 1930s, to identify firms' relative cost of internal and external funds and to analyze its effect on firms' investment decisions. They construct a dataset for 273 manufacturing firms for 1934-7 and find that almost one-quarter of the publicly traded firms retained more than 40 percent of their earnings in spite of the SUP, paying the highest marginal rates of surtax. The investment spending of these firms was sensitive to shifts in cash flow, holding constant investment opportunities (measured by the ratio of market to book value). There was no sensitivity of investment to internal funds discernible for firms with higher dividend payout and lower SUP liability. In addition, many firms with high marginal rates of surtax were in the growth industries of the day. The sensitivity of investment spending to internal funds for firms with high marginal SUP rates appears to reflect information-related frictions in the capital market as opposed to the waste of corporate cash flows by entrenched managers.

Asset Pricing Meeting

The first meeting of the NBER's new Program in Asset Pricing was held at the Bureau's New York office on November 8. The following papers were selected by John Y. Campbell of Princeton University, director of the program:

Miles S. Kimball, NBER and University of Michigan, and Douglas W. Elmendorf, Harvard University, "Taxation of Labor Income and the Demand for Risky Assets"

Discussant: Philippe Weil, NBER and Harvard University

John Heaton, NBER and MIT, and Deborah J. Lucas, NBER and Northwestern University, "Evaluating the Effects of Incomplete Markets on Risk Sharing and Asset Pricing"

Discussant: Mark Gertler, NBER and New York University

Daniel Nelson and Dean Foster, University of Chicago, "Rolling Regressions"

Discussant: Robin L. Lumsdaine, Princeton University

Robert F. Engle III, NBER and University of California, San Diego, and Victor K. Ng, University of Michigan, "Measuring and Testing the Impact of News on Volatility" (NBER Working Paper No. 3681)

Discussant: G. William Schwert, NBER and University of Rochester

Steven G. Cecchetti, NBER and Ohio State University, and Pok Sang Lam and Nelson Mark, Ohio State University, "Testing Volatility Restrictions on Intertemporal Marginal Rates of Substitution Implied by Euler Equations and Asset Returns"

Discussant: Robert F. Stambaugh, NBER and University of Pennsylvania

Blake LeBaron, University of Wisconsin, "Technical Trading Rules and Regime Shifts in Foreign Exchange"

Discussant: Angelo Melino, NBER and University of Toronto

Economists have been aware for a long time that background risk, such as the risk of uninsurable changes in income, can have an important effect on the demands for and prices of financial assets. Two papers presented at the meeting illustrate this point.

Kimball and Elmendorf use a two-period model to show that, under plausible conditions, income risk increases total saving but reduces the demand for risky assets. This result holds even when income and asset risks are uncorrelated, although it can be reversed if risky assets are correlated negatively with income. Thus, taxes on labor income, which partially insure income risk, can increase the economy's willingness to make risky investments even if they reduce the overall saving rate.

Heaton and Lucas develop a general equilibrium model in which two types of investors, with different income streams, trade stocks and bonds. In their model, income shocks are fairly short-lived. They show that transitory income risk by itself has little effect on equilibrium asset prices. Then they introduce transactions costs in asset markets, and show that the combination of income risk and transactions costs can help to explain the high stock return and low Treasury-bill return observed historically in the United States.

Two other papers presented at the meeting concentrate on the phenomenon of changing volatility in financial markets.

Measures of volatility are necessary for many practical tasks in finance, such as estimating betas or pricing options. One traditional way to estimate volatility at a point in time is to use a rolling regression. Nelson and Foster derive conditions on the true process for volatility under which simple rolling regressions will work well. They also show how to choose the number of lags to include in the regression, and how different lags should be weighted.

Engle and Ng survey alternative models of changing variance in the ARCH class of models originally introduced by Engle. They show that different models have different implications for the way in which current shocks affect future volatility. In the Japanese stock market, negative shocks increase volatility more than do positive shocks of the same size. Engle and Ng discuss several models that can be used to fit this behavior.

Asset pricing models generically relate assets' risk

premiums to their covariances with some “intertemporal marginal rate of substitution” (IMRS). In the simple Capital Asset Pricing Model, for example, the IMRS is proxied by the return of the market portfolio. In other models the IMRS may not be observable. However, recent work has shown that asset return data can be used to obtain a lower bound on the variance of the IMRS, given its mean. Cecchetti, Lam, and Mark discuss the statistical properties of this procedure and show that often there is great uncertainty about the variance bound.

Traditionally, economists have looked askance at technical or “chartist” rules for trading in financial markets. LeBaron shows that simple technical strategies are profitable in trading the U.S. dollar against the British pound, the German mark, and the Japanese yen over 1974–91. The profits generated by these strategies are inconsistent with several commonly used time-series models for exchange rates.

Also attending were NBER researchers: Andrew B. Abel and Stephen P. Zeldes, University of Pennsylvania; Robert E. Cumby, New York University; Kathryn M. Dominguez, Harvard University; Alberto Giovannini and Bruce N. Lehmann, Columbia University; Robert J. Hodrick, Northwestern University; and Robert J. Shiller, Yale University.

Labor Economists Meet

About 30 members and guests of the NBER’s Program in Labor Studies met in Cambridge on November 22. Four papers were discussed:

Benjamin Craig, University of Indiana, and John H. Pencavel, Stanford University, “Labor Market Outcomes Under Alternative Institutions: The Plywood Companies of Washington State”

Stephen Coate, University of Pennsylvania, and Glenn Loury, Boston University, “Will Affirmative Action Policies Eliminate Negative Stereotypes?”

David Card, NBER and Princeton University, and Phillip B. Levine, Wellesley College, “Unemployment Insurance Taxes and the Cyclical Properties of Employment and Unemployment”

Louis G. Jacobson, Upjohn Institute for Employment Research; Robert J. LaLonde, NBER and University of Chicago; and Daniel G. Sullivan, Northwestern University, “Earnings Losses of Displaced Workers”

The plywood companies of Washington state can be divided into three types of mills: union, nonunion, and labor-managed cooperatives. Their long history of coexistence—with a competitive output market, a relatively homogeneous product, and the same legal envi-

ronment—offers a unique opportunity to isolate the effect of the different institutions on labor market behavior. Craig and Pencavel study the employment, hours, and wage decisions for 41 mills from 1968–86. They find that all three factors are much more volatile for the nonunion plants than for the cooperatives.

Coate and Loury develop a model that suggests that affirmative action does not necessarily eliminate employers’ negative stereotypes, even when workers are ex ante identical. Indeed, affirmative action actually can worsen employers’ perceptions of the capabilities of minority workers.

The U.S. unemployment insurance system is financed by an experience-rated payroll tax. The system imposes a layoff or firing cost on employers, leading them to fire fewer workers in a downturn and hire fewer workers in an upturn. Therefore, increases in the degree of experience rating are predicted to reduce temporary layoffs in a recession and lower employment at the peak of the business cycle. Card and Levine combine Current Population Survey data for 1979–88 with a newly assembled database of experience-rating factors for individual states and industries to measure the effects of imperfect experience rating on temporary layoff unemployment rates over the cycle. They find a strong negative correlation between the degree of experience rating and the rate of layoff unemployment in recessionary years, but smaller and unsystematic correlations in expansionary years. They also find that cyclical fluctuations in employment are dampened in states and industries with a greater degree of experience rating.

To estimate the magnitude and temporal patterns of displaced workers’ lost earnings, Jacobson, LaLonde, and Sullivan use an administrative dataset that includes both employees’ quarterly earnings histories and information about their firms. They find that when long-tenured workers separate from distressed firms, their long-term losses average 25 percent of previous earnings per year. Further, their losses mount even prior to separation, are not limited to workers in a few industrial sectors, and are substantial even for those who find new jobs in similar firms.

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Baldwin is a research associate in the NBER's Program in International Studies and the Hilldale Professor of Economics at the University of Wisconsin at Madison.

The Macroeconomics of Populism in Latin America, edited by Rudiger Dornbusch and Sebastian Edwards, will sell for \$65 in hardcover or \$21.95 in paperback. The papers in this volume detail how and why populist programs in Latin America have failed. They examine failed policies in Argentina, Brazil, Chile, Mexico, Nicaragua, and Peru, and explain how Colombia was different from those countries. This book should be a valuable resource for scholars of Latin America, and may hold important lessons for the coming changes in Eastern Europe.

Dornbusch and Edwards are research associates in the NBER's international studies program. Dornbusch also is the Ford International Professor of Economics at MIT; Edwards is the Henry Ford II Professor of Economics at the University of California at Los Angeles.

The Economics of Art Museums, edited by Martin Feldstein, explores a number of significant issues facing major art museums: financial support; the management of the collections; relationships with the public; and government support. The volume includes six background papers written by economists and the personal statements of leaders of major museums and related foundations. A number of tables also provide valuable statistics on art museums, including finances and attendance figures. This volume should interest econo-

mists concerned with nonprofit institutions as well as museum officials.

Feldstein is president and CEO of the NBER and the George F. Baker Professor of Economics at Harvard University. The price of *The Economics of Art Museums* is \$49.95.

International Economic Transactions: Issues in Measurement and Empirical Research, Volume 55 of the NBER Studies in Income and Wealth, is priced at \$75. Editors Peter Hooper and J. David Richardson invited leading researchers in empirical international economics and foremost specialists on international transactions data to contribute to this volume. They addressed the measurement of international trade flows and prices, compared manufacturing output across countries, and assessed the extent of U.S. indebtedness to the rest of the world. This volume should serve as a reference for many years.

Hooper is assistant director of the Division of International Finance, Federal Reserve Board of Governors. Richardson is an NBER research associate in international studies and a professor of economics at Syracuse University.

Trade with Japan: Has the Door Opened Wider? edited by Paul R. Krugman, looks at Japanese trade patterns, financial markets, retail and wholesale distribution networks, and industrial and trade policy. Researchers from the United States and Japan contributed to this volume, which should interest those in business and government as well as academic economists.

Krugman is an NBER research associate in international studies and a professor of economics at MIT. This volume sells for \$50.

Inside the Business Enterprise: Historical Perspectives on the Use of Information, edited by Peter Temin, links modern economic theory and recent business history. The book describes in detail historical incidents in the birth of the modern business enterprise in the Gilded Age.

Temin is a research associate in the NBER's Program in Development of the American Economy and a professor of economics at MIT. The clothbound version of this volume sells for \$43; the paperback is \$14.95.

Current Working Papers

Individual copies of NBER Working Papers, Technical Working Papers, and Historical Factors in Long-Run Growth Working Papers are available free of charge to

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

Multiple authors are listed alphabetically. *Journal of Economic Literature* (JEL) subject codes, when available, are listed after the date of the Working Paper. Beginning with Technical Working Paper No. 115 and Working Paper No. 3897, abstract listings will identify the Bureau programs of research represented by each paper. The programs are: Aging; Asset Pricing; Corporate Finance; Development of the American Economy; Economic Fluctuations; Growth; Health Care; Health Economics; Industrial Organization; International Studies; Labor Studies; Monetary Economics; Productivity; and Taxation. Papers not identified with a specific NBER program are designated as Miscellaneous. All Historical Working Papers are in the Development of the American Economy program.

Abstracts of all Working Papers issued since September 1991 are presented below. For previous papers, see past issues of the *NBER Reporter*. Working Papers are intended to make results of NBER research available to other economists in preliminary form to encourage discussion and suggestions for revision before final publication. They are not reviewed by the Board of Directors of the NBER.

Technical Working Papers

Workings of a City: Location, Education, and Production

Roland Bénabou

Technical Working Paper No. 113
October 1991

We examine the implications of local externalities in human capital investment for the size and composition of the productive labor force. The model links residential choice, skills acquisition, and production in a city composed of several communities. Peer effects induce self-segregation by occupation, whereas efficiency may require identical communities. Even when some asymmetry is optimal, equilibrium segregation can cause entire "ghettos" to drop out of the labor force. The easier it is for high-skill workers to isolate themselves from others, the more extensive underemployment becomes. When perfect segregation is feasible, individual incentives to pursue it are self-defeating, and lead instead to a shutdown of the productive sector.

Eastern Data and Western Attitudes

Edward E. Leamer

Technical Working Paper No. 114

October 1991

JEL Nos. C51, O40

Most studies of the economies of Eastern Europe by western analysts depend substantially on western data and western attitudes. Usually this dependence is implicit and concealed. An explicit and transparent treatment may yield better results, both for the individual analyst and for the profession overall. This paper proposes and illustrates an econometric method for pooling western and eastern data. The pooled estimates depend on doubt about the western attitudes, on the degree of experimental contamination in western and eastern data, and on the similarity of western and eastern structures. I illustrate the method with a study of the determinants of the growth rates of developed and developing countries.

Instrumental Variables Estimation of Average Treatment Effects in Econometrics and Epidemiology

Joshua D. Angrist

Technical Working Paper No. 115

November 1991

Labor Studies

The average effect of intervention or treatment is an interesting parameter in both epidemiology and econometrics. A key difference between applications in the two fields is that epidemiologic research is more likely to involve qualitative outcomes and nonlinear models.

I recently used data on the Vietnam-era draft lottery to construct estimates of the effect of Vietnam-era military service on civilian mortality. In my paper, I presented necessary and sufficient conditions for linear instrumental variables techniques to estimate average treatment effects consistently in qualitative or other nonlinear models. Most latent index models commonly applied to qualitative outcomes in econometrics fail to satisfy these conditions. So I also presented Monte Carlo evidence on the bias of instrumental estimates of the average treatment effect in a bivariate probit model.

It turns out that linear instrumental variables estimators perform nearly as well as the correctly specified maximum-likelihood estimator, especially in large samples. Linear instrumental variables and the normal maximum-likelihood estimator are also remarkably robust to non-normality.

A Note on the Time-Elimination Method for Solving Recursive Dynamic Economic Models

Casey B. Mulligan and Xavier Sala-i-Martin

Technical Working Paper No. 116

November 1991

Growth

We describe the Time-Elimination Method for solving recursive dynamic economic models. By defining

control-like and state-like variables, we can transform the equations of motion describing the economy's evolution through time into a system of differential equations independent of time. Unlike the transversality conditions, the boundary conditions for the system in the state-like variable are not asymptotic. In theory, this reformulation of the problem greatly facilitates numerical analysis. In practice, problems that were impossible to solve with a popular algorithm—shooting—can be solved in short order.

Readers of this paper need not have any knowledge of numerical mathematics nor dynamic programming, nor need they be able to draw high-dimensional phase diagrams. Only a familiarity with the first-order conditions of the "Hamiltonian" method for solving dynamic optimization problems is required.

Time-Elimination most naturally applies to growth models. We apply it to three growth models; the Ramsey/Cass/Koopmans one-sector model; Jones and Manuelli's (1990) variant of the Ramsey model; and a two-sector growth model in the spirit of Lucas (1988). We also provide a very simple but complete computer program for solving the Ramsey model numerically.

Sources of Identifying Information in Evaluation Models

Joshua D. Angrist and Guido W. Imbens

Technical Working Paper No. 117

December 1991

Labor Studies

The average effect of social programs on such outcomes as earnings is a parameter of primary interest in econometric evaluation studies. We present new results on using exclusion restrictions to identify and estimate average treatment effects. We achieve identification given a minimum of parametric assumptions, initially without reference to a latent index framework. Most econometric analyses of evaluation models motivate identifying assumptions using models of individual behavior. Our technical conditions do not fit easily into a conventional discrete choice framework. Rather, they fit into a framework in which the source of identifying information is institutional knowledge regarding program administration. This framework also suggests an attractive experimental design for research using human subjects, in which eligible participants need not be denied treatment. We present a simple instrumental variables estimator for the average effect of treatment on program participants, and show that the estimator attains Chamberlain's semiparametric efficiency bound. We also consider the bias of estimators that satisfy only exclusion restrictions.

Identification and Estimation of Local Average Treatment Effects

Joshua D. Angrist and Guido W. Imbens

Technical Working Paper No. 118

December 1991

Labor Studies

We investigate conditions sufficient for identification of average treatment effects using instrumental

variables. First we show that the existence of valid instruments is not sufficient to identify any meaningful average treatment effect. We then establish that the combination of an instrument and a condition on the relationship between the instrument and the participation status is sufficient for identification of a local average treatment effect for those who can be induced to change their participation status by changing the value of the instrument. Finally, we derive the probability limit of the standard IV estimator under these conditions. It is a weighted average of local average treatment effects.

Historical Factors in Long-Run Growth

The Rise of the Chicago Meat Packers and the Origins of Meat Inspection and Antitrust

Gary D. Libecap

Historical Working Paper No. 29

September 1991

JEL Nos. N41, K21, L15

The Meat Inspection Act of 1891 and the Sherman Act of 1890 are tied closely, making clearer Congress's intent in enacting the legislation. Both laws are products of economic conditions after 1880, and reflect, in part, a common concern about the Chicago packers, or beef trust. The concerns of local slaughterhouses, which were being displaced by new, low-cost refrigerated beef, and of farmers who sold their livestock to the large Chicago packers, were echoed elsewhere by other small businesses and farmers, who also feared for their competitive positions during a time of structural change in the economy.

Agricultural Seasonality and the Organization of Manufacturing During Early Industrialization: The Contrast Between Britain and the United States

David Dollar and Kenneth L. Sokoloff

Historical Working Paper No. 30

September 1991

The United States differed dramatically from Britain in organization of manufacturing during early industrialization. Even before widespread mechanization, American production came almost exclusively from centralized plants, whereas the British and other European economies were characterized by extensive cottage manufacture.

We argue that this contrast was rooted in a salient disparity between the land-to-labor ratios of the two countries. Together with its later settlement, the relative abundance of land in the United States led to its agricultural sector being much less concentrated in grain than British agriculture was. Since the labor re-

quirements of grain production were much more seasonal than those of the other major agricultural products of the era (dairy products, livestock, wood, and cleared land), and because agriculture was the dominant sector in both economies, there were more seasonal fluctuations in British labor markets than in American ones. We argue that this difference in the extent of seasonality is crucial, because cottage manufacture had a relative advantage in the use of offpeak or part-time labor.

The Use of Historical Census Data for Mortality and Fertility Research

Michael R. Haines

Historical Working Paper No. 31

October 1991

This paper shows how to apply indirect techniques for estimating fertility and mortality to historical census data, both published and as micro census samples derived from the original enumerators' manuscripts. In many instances census data exist, but adequate vital registration data do not: for example, for the United States prior to 1933, when the Birth and Death Registration Areas finally covered the entire nation. But since the United States has taken decennial censuses since 1790, and since all the original population schedules (except those for 1890) have been preserved, it is possible to apply indirect methods.

For example, the 1900 and 1910 censuses asked questions about children born, children surviving, and duration of current marriage. This information was never tabulated or used for 1900, and was only partly tabulated for 1910. But the Public Use Samples of the 1900 and 1910 censuses make it possible to use the data to estimate levels, differentials, and even recent trends in childhood mortality.

Applying own-children methods to samples of the censuses since 1850 also permits estimation of age-specific fertility rates, both overall and marital. Finally, using the 1900 Public Use Sample along with published data on parity from the 1910 census (or tabulations from the 1910 Public Use Sample) allows us to apply the two-census, parity increment method of estimation of birth rates.

Capital Flows to the New World as an Intergenerational Transfer

Alan M. Taylor and Jeffrey G. Williamson

Historical Working Paper No. 32

December 1991

JEL Nos. F21, E21, N30

Why did international capital flows rise to such heights in the late 19th century, in particular between 1907 and 1913? Britain placed half of her annual savings abroad during those seven years, 76 percent of which went to Canada, Australia, the United States, and Latin America. Those resource-abundant New World countries had a scarcity of labor and capital. Both immigration and

high fertility were responses to labor scarcity, creating much higher child dependency burdens in the New World than in the Old. These dependency burdens choked off domestic saving in the New World, thus creating a very large external demand for savings. Indeed, the vast majority of those international capital flows from Old World to New can be explained by gaps in the dependency rate. As a consequence, those large international capital flows may be viewed as an intergenerational transfer.

Whom Did Protective Legislation Protect? Evidence from 1880

Jeremy Atack and Fred Bateman
Historical Working Paper No. 33
December 1991
JEL Nos. N61, N31, N41, K31

Laws limiting hours of work for women and children first emerged in the mid-19th century in the vanguard of progressive legislation. Today the dominant interpretation of such legislation is that it reflects successful rent-seeking by some group. Specifically, men sought such laws to restrict job opportunities for women. Indeed, these laws may have had this effect in the late 20th century. However, we believe that the laws emerged in response to demands by both men and women for shorter hours that they had been unable to secure through individual or collective bargaining. As contemporaries put it, men fought the battle for shorter hours "from behind the petticoats of women." The laws brought shorter hours to both men and women, and do not seem to have displaced women from the workplace at the time.

The differential impact of these laws between the late 19th and the late 20th centuries reflects society's success in eliminating other forms of sex discrimination. In the 19th century, thanks to rigid gender-based occupational segregation, men and women were complementary factors of production. With the breakdown of such rules, they became substitutes, and men came to reap some rents from hours regulations that were not anticipated when the legislation was adopted.

NBER Working Papers

Designing a Central Bank for Europe: A Cautionary Tale from the Early Years of the Federal Reserve System

Barry J. Eichengreen
Working Paper No. 3840
September 1991
JEL Nos. E50, E58, N22

Important questions remain to be answered concerning the structure and operation of a European central bank. Although there exists no precedent for

the process of institution-building in which the European Community is currently engaged, the founding and early operation of the Federal Reserve System in the United States provides a suggestive parallel. It suggests: 1) that Stage 2 of the Delors Plan contains potential sources of instability; 2) attempting a direct transition from Stage 1 (national monetary autonomy) to Stage 3 (centralization of authority); and 3) the need for more thought about voting and mediation procedures to be used to reconcile and aggregate national interests.

Rail Costs and Capital Adjustments in a Quasi-Regulated Environment

**Ernst R. Berndt, Judy Shaw-Er Wang Chiang,
Ann F. Friedlaender, Mark Showalter,
and Christopher A. Velluro**
Working Paper No. 3841
September 1991
JEL Nos. D24, L21, L5

This paper reports on results obtained from the estimation of a rail cost function using a pooled-time series, cross section of Class I railroads for 1974-86. We analyze short-run and long-run returns to scale, the extent of capital disequilibrium, and adjustments to way and structures capital in the heavily regulated and quasi-regulated environments before and after the passage of the Staggers Act in 1980. In general, we find that there is considerable overcapitalization in the rail industry. This has persisted in spite of the regulatory freedom provided by the Staggers Act.

Measuring the Contribution of Public Infrastructure Capital in Sweden

Ernst R. Berndt and Bengt Hansson
Working Paper No. 3842
September 1991
JEL Nos. D24, H41

This paper examines the contribution of public infrastructure capital on private sector output and productivity growth in Sweden. We specify and empirically implement a number of alternative econometric models using annual data for Sweden from 1960-88.

Using a dual cost function approach, we find that increases in public infrastructure capital, other things being equal, reduce private sector costs. We compute the amount of public infrastructure capital that would rationalize the cost saving incurred by the private business and manufacturing sectors. We find that this amount is less than what in fact was available in 1988, but the extent of excess public infrastructure capital has been falling in the 1980s.

Changing Social Security Survivorship Benefits and the Poverty of Widows

Michael D. Hurd and David A. Wise
Working Paper No. 3843
September 1991
JEL Nos. J14, H55

This paper considers the effect on widows' poverty of changes in Social Security survivorship benefits,

achieved by a reduction in couples' benefits but leaving unchanged total Social Security cost. A 20 percent increase in survivorship benefits, for example, would reduce the 1989 poverty rate of widows aged 65-69 by about 24 percent, from 0.25 to 0.19. The poverty rate of couples would be *increased* by about 33 percent, from about 0.06 to 0.08.

Trigger Points and Budget Cuts: Explaining the Effects of Fiscal Austerity

Giuseppe Bertola and Allen Drazen

Working Paper No. 3844

September 1991

JEL Nos. E21, E62

We propose and solve an optimizing model that explains the counterintuitive effects of fiscal policy in terms of expectations. If government spending follows an upward-trending stochastic process, and the public believes it may fall sharply when it reaches specific "target points," then optimizing consumption behavior and a simple budget constraint arithmetic imply a non-linear relationship between private consumption and government spending. This theoretical relationship is consistent with the experiences of several countries.

Trade Adjustment Assistance and Pareto Gains from Trade

Robert C. Feenstra and Tracy R. Lewis

Working Paper No. 3845

September 1991

JEL No. F13

In a model in which all factors of production are imperfectly mobile, the Dixit-Norman scheme of commodity taxes may not lead to strict Pareto gains from trade. Rather, this scheme must be augmented by policies that give factors an incentive to move: hence, the role for trade adjustment assistance (TAA). We demonstrate that by knowing the distribution of adjustment costs across individuals, the government can offer a single TAA subsidy to all individuals willing to move between industries, and maintain a nonnegative budget. The TAA subsidy, combined with the Dixit-Norman pattern of commodity taxes, can lead to Pareto gains from trade under the conditions we identify.

Do Institutional Investors Destabilize Stock Prices? Evidence on Herding and Feedback Trading

Josef Lakonishok, Andrei Shleifer, and Robert W. Vishny

Working Paper No. 3846

September 1991

JEL Nos. G23, E20

This paper uses a new dataset of quarterly portfolio holdings of 769 all-equity pension funds between 1985 and 1989 to evaluate the potential effect of the funds'

trading on stock prices. We address two aspects of trading by money managers: herding, which refers to buying (selling) the same stocks as other managers buy (sell) at the same time; and positive-feedback trading, which refers to buying winners and selling losers. These two aspects of trading are commonly a part of the argument that institutions destabilize stock prices. At the level of individual stocks at quarterly frequencies, we find no evidence of substantial herding or positive-feedback trading by pension fund managers, except in small stocks. Also, there is no strong cross-sectional correlation between changes in pension funds' holdings of a stock and abnormal returns on that stock.

The Optimal Two-Bracket Linear Income Tax

Yoram Mayshar, Joel B. Slemrod, and Shlomo Yitzhaki

Working Paper No. 3847

September 1991

We investigate the optimal rate structure of an income tax system that is constrained to have only two brackets, plus a demogrant (or general credit). We find that, in a two-class economy, Pareto-efficient schedules feature at least one marginal tax rate equal to zero. The marginal tax rate may be increasing or declining.

Next we use numerical optimization techniques to study the optimal structure of such a tax system in a multiperson model that is a stylized version of an actual economy. We discover that in all cases the tax rate in the second (higher) bracket is *less* than the tax rate that applies to the first bracket. Still, progressivity, in the sense of a uniformly rising average tax rate, generally obtains. Compared to the optimal one-bracket (linear) tax system, both the highest and lowest-income individuals are better off, while a middle range of taxpayers is worse off.

Policy Uncertainty, Persistence, and Growth

Joshua Aizenman and Nancy P. Marion

Working Paper No. 3848

September 1991

JEL No. F31

This paper provides evidence on the correlation between policy uncertainty and per capita real GDP for 46 developing countries from 1970-85. Cross-section regressions on growth suggest that, after accounting for standard variables from the endogenous growth literature, there is a correlation between policy uncertainty and growth. The importance of the correlation, and even its sign, depend on the particular policy and on the geographical region.

Policy uncertainty may affect growth through the investment channel. Using an endogenous growth model, in which domestic investment is characterized by irreversibilities and policy fluctuates between a high- and a low-tax regime, we show that the gap between the two regimes and the persistence of a regime jointly determine the pattern of investment and growth. Policy uncertainty in the absence of persistence does not affect long-run growth.

World Interest Rates and Investment

Robert J. Barro

Working Paper No. 3849

September 1991

JEL Nos. E4, E6, F3

In a world of integrated capital markets, the price of credit—which I measure by short-term expected real interest rates—equates the world aggregate of investment demand to the world aggregate of desired national saving. I implement this approach empirically by approximating the world by aggregates for ten major developed countries. Since 1959, the common component of expected real interest rates for these countries relates especially to developments on world stock and oil markets and, secondarily, to world monetary and fiscal policies.

The Effects of Child Health on Marital Status and Family Structure

Hope Corman and Robert Kaestner

Working Paper No. 3850

September 1991

JEL Nos. J12, I10

This paper provides evidence of the effect of child health on marital stability and family structure. We use the 1988 National Health Interview Survey's Child Health Supplement, with a sample of about 9000 families, to test whether having an unhealthy child decreases the mother's chance of being married, and whether it increases her chance of living in an extended family.

Using two different measures of child health, we find that having an unhealthy child does decrease the mother's likelihood of being married. Our results are strongest for white women who were married at the time of the child's birth, and for black women who were unmarried at that time.

These results imply that children in poor health more likely will face obstacles beyond their illness: they also will be more likely to suffer the consequences of poverty and poor schooling that result from being raised in a household headed by a female. The only mitigating factor is that, for whites, these children will be more likely to live in an extended family than healthy children will.

Factor Shares and Savings in Endogenous Growth

Giuseppe Bertola

Working Paper No. 3851

September 1991

JEL Nos. O40, D72

This paper studies the distributive effects of growth when different agents' income is drawn from accumulated and nonaccumulated factors of production in different proportions. Political interactions may con-

tribute to determine factor shares and growth when income sources are heterogeneous. This suggests that distributional issues should be taken into account both when formulating growth-oriented policy prescriptions and when interpreting the wide dispersion of growth rates across economies and over time.

Halting Inflation in Italy and France After World War II

Alessandra Casella and Barry J. Eichengreen

Working Paper No. 3852

September 1991

JEL Nos. E63, E65, F41, N14

In the aftermath of World War II, Italy and France experienced high inflation. The two countries enacted remarkably similar economic policy measures, but stabilization came at different times: for Italy at the end of 1947, for France a year later. Traditional explanations for regained price stability cannot account for this difference in timing.

In this paper, we use the international comparison to shed light on the nature of the inflationary process and on the cause of its decline. We conclude that inflation was symptomatic of an unresolved distributional conflict. It ended when one political group, the Left in each of these countries, accepted its defeat. The Marshall Plan helped to bring about the stabilization by reducing the costs to the group that offered concessions. We argue that the French delay in stabilizing can be imputed to differences in the political climate and to the ambitious program of public investment.

The University in the Marketplace: Some Insights and Some Puzzles

Michael Rothschild and Lawrence J. White

Working Paper No. 3853

September 1991

Higher education has many of the attributes of a competitive industry. Many enterprises compete for inputs and sell similar outputs to a great variety of buyers. Yet the competitive perspective has not been used much in the analysis of higher education.

In this paper, we find that such a point of view yields both insights and puzzles. The familiar "stand-alone" test from industrial organization casts doubt on the claim that undergraduate education subsidizes graduate education in the large research university. Since institutions that sell both graduate and undergraduate education survive in competition with institutions that sell only undergraduate education, the claim of cross subsidization is hard to maintain. We note that the analysis of the use of prices to regulate admission to universities is complex, because students are both inputs and outputs of the educational process. We also note, but do not explain, some conspicuous failures of universities to use incentives and prices.

Perhaps most interesting are the failures of research universities to reward excellent teaching (which has a clear market value), and the failure of elite institutions, particularly professional schools, to exploit their pre-eminent market positions by charging a tuition that begins to capture the rents that graduation confers.

Changes in the Cyclical Sensitivity of Wages in the United States, 1891–1987

Steven G. Allen

Working Paper No. 3854

September 1991

JEL No. E24

This paper reexamines the conventional wisdom that nominal wages became less sensitive to the business cycle and more autocorrelated after World War II by considering whether these properties are artifacts of the methods used to construct prewar wage series. A replication based on these methods is more sensitive cyclically and exhibits less autocorrelation than the postwar data. Aggregation using variable, instead of fixed, employment weights also greatly exaggerates the cyclicity of prewar wages. These biases imply that wages are just as sensitive to the cycle today as they were 100 years ago, perhaps even more so.

Fiscal Federalism and Optimum Currency Areas: Evidence for Europe from the United States

Jeffrey D. Sachs and Xavier Sala-i-Martin

Working Paper No. 3855

October 1991

This paper estimates to what extent the U.S. government insures the states against shocks to regional income. We find that a one dollar reduction in a region's per capita personal income triggers a decrease in federal taxes of about 34 cents and an increase in federal transfers of about 6 cents. Hence, the final reduction in disposable per capita income is on the order of 60 cents. That is, between one-third and one-half of the initial shock is absorbed by the federal government.

Taxes react much more than transfers to these regional imbalances because the main mechanism at work is the federal income tax system. This in turn means that the stabilization process is automatic, rather than specifically designed each time there is a cyclical movement in income.

Some economists may argue that this regional insurance scheme provided by the federal government is one important reason why the system of fixed exchange rates that exists within the United States today has survived without major problems. Under this view, the creation of a European Central Bank that issues a unified currency without the simultaneous introduction (or expansion) of a fiscal federalist system could be risky.

In fact, rough calculations of the impact of the existing European tax system on regional income suggests

that a one dollar shock to regional GDP will reduce tax payments to the European Economic Community government by half a cent! Hence, the current European tax system has a long way to go before it reaches the 34 cents of the U.S. federal government.

Another Look at the Evidence on Money–Income Causality

Benjamin M. Friedman and Kenneth N. Kuttner

Working Paper No. 3856

October 1991

JEL No. E52

Stock and Watson's widely noted finding that money has statistically significant marginal predictive power with respect to real output (as measured by industrial production), even in a sample extending through 1985 and even in the presence of a short-term interest rate, is not robust to two plausible changes. First, extending the sample through 1990 renders money insignificant within Stock and Watson's chosen specification. Second, using the commercial paper rate in place of the Treasury bill rate renders money insignificant even in the sample ending in 1985.

However, the difference between the commercial paper rate and the Treasury bill rate *does* have highly significant predictive value for real output, even in the presence of money, regardless of the sample.

Alternative results indicate that money has a small and generally insignificant effect, and that the paper-bill spread has a large and highly significant effect, on real output.

Unobserved Ability, Efficiency Wages, and Interindustry Wage Differentials

McKinley L. Blackburn and David Neumark

Working Paper No. 3857

October 1991

JEL Nos. J31, J33, J41

Interindustry wage differentials among individuals have been interpreted as evidence for an efficiency wage. Another explanation for these differentials is that they are generated by differences among workers in unobserved ability. This paper incorporates test scores into standard wage regressions as indicators of unobserved ability. We find that differences in unobserved ability explain relatively little of interindustry or interoccupation wage differentials.

How Computers Have Changed the Wage Structure: Evidence from Microdata, 1984–9

Alan B. Krueger

Working Paper No. 3858

October 1991

JEL Nos. C80, J30

This paper examines whether employees who use a computer at work earn a higher wage rate than other-

wise similar workers who do not use a computer at work. The analysis relies primarily on data from the Current Population Survey and the High School and Beyond Survey.

I find that workers who use computers on their jobs earn roughly a 10 to 15 percent higher wage rate. In addition, the expansion in computer use in the 1980s may account for between one-third and one-half of the observed increase in the rate of return to education. Finally, I find that occupations that experienced greater growth in computer use between 1984 and 1989 also experienced above-average wage growth.

Evidence on Employment Effects of Minimum Wages and Subminimum Wage Provisions from Panel Data on State Minimum Wage Laws

David Neumark and William Wascher

Working Paper No. 3859

October 1991

JEL Nos. J23, J31, J38

We construct a panel dataset on state-level minimum wage laws and economic conditions to use in reevaluating existing evidence, most of which comes from time-series data, on minimum wage effects on employment. Our estimates of the elasticities of employment-to-population ratios for teens and young adults primarily fall in the range of -0.1 to -0.2 , similar to the consensus range of estimates from time-series studies. We also find that youth subminimum wage provisions enacted by state legislatures have moderated the disemployment effects of minimum wages.

The European Central Bank: Reshaping Monetary Politics in Europe

Alberto Alesina and Vittorio U. Grilli

Working Paper No. 3860

October 1991

This paper analyzes how the creation of a European Central Bank (ECB) will change the political economy of monetary policy in Europe. The 12 governors of the national central banks of the European Economic Community recently proposed a statute for the ECB that delineates its institutional structure. We discuss the likely consequences of this statute on the conduct of monetary policy at the European level, particularly from the point of view of the trade-off between inflation and stabilization. We also investigate the role of political independence of the ECB, and the effect of the voting rules for the appointments of the ECB board members on policy choices.

On Biases in the Measurement of Foreign Exchange Risk Premiums

Geert Bekaert and Robert J. Hodrick

Working Paper No. 3861

October 1991

JEL No. G15

The hypothesis that the forward rate is an unbiased predictor of the future spot rate has been rejected con-

sistently in recent empirical studies. This paper examines several sources of measurement error and misspecification that might have induced biases in such studies. Although previous inferences were robust to a failure to construct true returns, and to omitted variable bias arising from conditional heteroscedasticity in spot rates, the parameters were not stable from 1975-89. Allowing for endogenous regime shifts in the parameters demonstrates that deviations from unbiasedness were more severe in the 1980s.

Stock Price Manipulation, Market Microstructure, and Asymmetric Information

Franklin Allen and Gary Gorton

Working Paper No. 3862

October 1991

JEL Nos. G12, G14

In recent years, much has been written about how stock exchange specialists set prices when some investors know more about the stock than they do. An important assumption in this literature is that there are "liquidity traders," who are equally likely to buy or sell for exogenous reasons. Some buyers plausibly have cash needs and are forced to sell their stock. However, buyers usually will be able to choose the time at which they trade. Optimally, they will minimize the probability of trading with informed investors by choosing an appropriate time to trade, and by clustering at that time. When liquidity buyers are not clustering, purchases more likely are made by an informed trader than sales are; so the price movement resulting from a purchase is larger than for a sale. As a result, profitable manipulation by uninformed investors may occur. We present a model in which the specialist takes account of the possibility of manipulation in equilibrium.

What Is a Business Cycle?

Victor Zarnowitz

Working Paper No. 3863

October 1991

JEL No. E32

Part 1 of this paper looks at economic history and the development of thinking about business cycles: the popular meaning and economists' definitions and ideas. Part 2 reviews the lessons from business cycle chronologies and duration data, the concepts of periodicity of cycles and phases, and the apparent moderation of macroeconomic fluctuations in the second half of the 20th century. Part 3 compares the recent business cycles and growth cycles for several major industrialized, market-oriented countries. Part 4 discusses the role of endogenous cyclical variables, the outside shocks of various types, the systematic timing sequences, and the regularities of cyclical comovements and amplitudes.

Over the past 200 years, business cycles have varied greatly in length, spread, and size. At the same time, they are distinguished by their recurrence, persistence, and pervasiveness. They make up a class of varied, complex, and evolving phenomena of both history and economic dynamics. Theories or models that try to reduce them to a single causal mechanism or shock are unlikely to succeed.

Flexibility, Investment, and Growth

Giuseppe Bertola

Working Paper No. 3864

October 1991

JEL Nos. J60, O41

This paper proposes a model of diversifiable uncertainty, irreversible investment decisions, and endogenous growth. The detailed microeconomic structure of the model makes it possible to study the general equilibrium effects of obstacles to labor mobility. Labor mobility costs: reduce private returns to investment; imply a slower rate of endogenous growth; and unambiguously lower a representative agent's welfare. If external effects are disregarded, restricted labor mobility may be consistent with higher wage levels in full employment equilibrium: this may help to explain why labor's political representatives often tend to decrease labor mobility in reality, rather than to enhance it. The lower growth rate of "disembodied" productivity, however, implies slower wage growth in equilibrium, with negative welfare effects even for agents who own only labor.

Irreversibility and Aggregate Investment

Giuseppe Bertola and Ricardo J. Caballero

Working Paper No. 3865

October 1991

JEL Nos. E22, C61

Investment often is irreversible, in that installed capital has little or no value unless used in production. In the presence of ongoing uncertainty, an individual firm's irreversible investment policy optimally alternates short bursts of positive gross investment to periods of inaction, when the installed capital stock is allowed to depreciate. The behavior of aggregate investment series is characterized by sluggish, continuous adjustment instead.

In this paper we argue that aggregate dynamics should be interpreted in terms of unsynchronized irreversible investment decisions by heterogeneous firms, rather than in terms of ad hoc adjustment cost functions in a representative-agent framework. We propose a closed-form solution for a realistic model of sequential irreversible investment, characterize the aggregate implications of microeconomic irreversibility and idiosyncratic uncertainty, and interpret U.S. data in light of the theoretical results.

Labor Turnover and Average Labor Demand

Giuseppe Bertola

Working Paper No. 3866

October 1991

JEL No. J23

This paper studies simple partial equilibrium models of dynamic labor demand under uncertainty. Labor turnover costs may decrease the firm's average labor demand, depending on the form of the revenue function, the rates of discount and labor attrition, and the relative size of hiring and firing costs. With strictly positive rates of discount and labor attrition, the firm's optimal policy is partially myopic. Firing costs well may increase average employment, even when hiring costs reduce it.

Has Macro-Forecasting Failed?

Victor Zarnowitz

Working Paper No. 3867

October 1991

JEL No. E37

This paper basically asks what professional standards economists engaged in macro-forecasting have been able to attain and maintain in competing with each other and with alternative methods.

There is much disenchantment with economic forecasting. The difficult question is how much of that is caused by unacceptably poor performance and how much by unrealistically high prior expectations. I argue that the latter is a major factor.

In times of continuing expansion with restrained inflation, as in the 1960s, macro-forecasts looked good and economists were held in high repute. Later, when inflation accelerated, serious recessions reappeared, and long-term growth of productivity and total output slackened, the errors of macroeconomic models and forecasts, and the old and new controversies among the economists, received increased public attention. The reputation of the profession suffered, and the interest of academic economists in forecasting, never very strong, weakened still more.

Yet the performance of professional economic forecasters, when assessed in the proper relative terms, has been considerably better in recent times than in the earlier post-World War II period. What happened is that the improvements fell short of enabling the forecasters to cope with the new problems they faced.

Private versus Socially Optimal Provision of Ex Ante Legal Advice

Louis Kaplow and Steven Shavell

Working Paper No. 3868

October 1991

JEL Nos. K40, D89

This paper considers whether the demand for legal advice about potential liability for future acts is social-

ly excessive. Using the standard model of accidents, we find that the answer depends on the type of advice and the form of liability. When advice provides information about properly determined liability, the demand for advice is socially optimal under strict liability but is socially excessive under the negligence rule. When advice identifies errors that the legal system is expected to make, then the demand for advice is socially excessive under both liability rules.

Endogenous Macroeconomic Growth Theory

Elhanan Helpman

Working Paper No. 3869

October 1991

JEL No. O40

This paper focuses on the innovation-based approach to endogenous growth. It spells out conditions for sustained long-run growth in neoclassical economies and compares them with the conditions required to sustain long-run growth in economies with product innovation. Two models of product innovation, which share the same fundamental mechanism of economic growth, then are used to relate structural features to long-run growth rates, and are applied to a number of policy issues, including unemployment and trade relations.

Patent Races, Product Standards, and International Competition

Richard Jensen and Marie C. Thursby

Working Paper No. 3870

October 1991

JEL Nos. O32, L15, F12

We examine anticipatory product standards intended to improve the strategic position of firms that are in an international patent race, and that use R and D to develop products that are close substitutes. We show that the effects of a standard depend on the way it is specified, which firm develops which product, and the order in which the products are discovered. In general, simple standards are time inconsistent, because consumer losses occur when products ruled out by the standard are discovered before the product set as the standard is. A state-contingent standard is time consistent when compulsory licensing is introduced by the foreign firm.

Younger Households' Saving: Evidence from Japan and Italy

Albert Ando and Luigi Guiso

Working Paper No. 3871

October 1991

Both young and old consumers appear to dissave too little for their behavior to be consistent with a strict

life-cycle model. We concentrate on young households and document their behavior, drawing from Italian and Japanese data. We also provide a theoretical framework to explain the dissaving without making assumptions about the working of credit markets or the degree of foresight of consumers.

Hospital Costs and the Cost of Empty Hospital Beds

Gerard F. Anderson and Martin Gaynor

Working Paper No. 3872

October 1991

JEL Nos. I10, L84, I18, D20

Utilized capacity in the hospital industry, as measured by the inpatient hospital bed occupancy rate, has declined over the past ten years and now stands at approximately 65 percent. Congress and the administration are concerned that the costs associated with empty beds represent wasteful expense; they have proposed an adjustment to Medicare payment rates that will penalize hospitals with low occupancy rates. On the other hand, hospitals have indicated that the costs of empty hospital beds are low, and that reimbursement adjustments are unnecessary.

To provide more current and representative estimates of an empty hospital bed, we estimate the cost function model of Friedman and Pauly using data from a national sample of 5315 hospitals for 1983-7. We find that empty beds account for approximately 18 percent of total costs, or \$546 per admission (1987 dollars). The estimate (in 1987 dollars) of the cost of an empty hospital bed is approximately \$38,000.

Asset Pricing and Intrinsic Values: A Review Essay

Bruce N. Lehmann

Working Paper No. 3873

October 1991

JEL Nos. G12, G31, G35

The efficient-markets hypothesis has dominated modern research on asset prices. Asset prices and their intrinsic values differ in inefficient financial markets, but difficulties in measuring intrinsic value greatly complicate tests of market efficiency.

This review essay on the state of knowledge about market efficiency focuses on *A Reappraisal of the Efficiency of Financial Markets*, analyzing the research areas from this perspective: 1) short-run stock return predictability; 2) asset pricing anomalies; and 3) excess volatility and present-value relationships.

Housing and Saving in the United States

Jonathan S. Skinner

Working Paper No. 3874

October 1991

During the 1970s, the share of housing wealth in total household wealth grew from roughly 20 percent to 30 percent, delivering a windfall of \$700 billion to homeowners. How might this fundamental shift affect aggregate capital accumulation?

I survey the growing literature on life-cycle housing choices to shed light on this question. The literature suggests that the shift in housing wealth will have a minimal impact on capital accumulation.

Second, how might an *unexpected* increase in housing prices affect short-term saving by homeowners? There is mixed evidence: some studies suggest that homeowners are saving their windfalls; others suggest a moderate degree of depletion.

Third, how have renters responded to the now higher cost of homeownership? Renters appear to save more in response to higher housing prices, although the effects are not quantitatively large relative to aggregate saving.

Finally, are post-1970s homeowners at greater financial risk because of volatile housing prices and over-leveraged housing purchases? New evidence suggests that they do not face greater risk: median households are less highly mortgaged in 1986 than in 1969, and the volatility of housing prices has not changed significantly during the same period.

Crime and the Employment of Disadvantaged Youths

Richard B. Freeman

Working Paper No. 3875

October 1991

This paper examines the magnitude of criminal activity among disadvantaged youths in the 1980s. It shows that a large proportion of youths who dropped out of high school, particularly black dropouts, developed criminal records in the decade. Those who were incarcerated in 1980 or earlier were much less likely to hold jobs over the entire decade than other youths were. The magnitudes of incarceration, probation, and parole among black dropouts, in particular, suggest that crime has become an intrinsic part of the youth unemployment and poverty problem. The limited evidence on the returns to crime suggests that, with the decline in earnings and employment for less-educated young men, crime offers an increasingly attractive alternative.

Financial Development, the Trade Regime, and Economic Growth

Nouriel Roubini and Xavier Sala-i-Martin

Working Paper No. 3876

October 1991

We survey the literature on the relationship between the trade regime and growth and financial develop-

ment, financial repression, and growth alone. Analyzing a large cross section of countries, we find that there is a negative relationship between trade distortions and growth. Some variables actually capture the degree of distortion in the financial sector.

We also find that financial repression has negative consequences for growth. Inflation too is negatively related to growth. However, we interpret this relationship as symptomatic rather than causal.

Once we hold constant measures of the trade regime and financial repression, the regional dummies for Latin America no longer are significant. Thus, we conclude, the poor performance of the Latin American countries over the last few decades is related to the trade and financial policies pursued by their governments.

The Consequences of Minimum Wage Laws: Some New Theoretical Ideas

James B. Rebitzer and Lowell J. Taylor

Working Paper No. 3877

October 1991

JEL Nos. J41, J42, J38

Economists generally agree that the immediate and direct effect of a binding minimum wage law is to move firms backward along the demand curve for low-skill workers. We reexamine the theoretical basis for the consensus view of minimum wage laws. Our central finding is that when firms use the threat of dismissal to elicit high levels of work effort, an increase in the minimum wage may have the immediate and direct effect of *increasing* the level of employment in low-wage jobs. Despite its similar logic, our model is unlike the monopsony model, since the positive employment effect of the minimum wage emerges in a labor market comprised of a large number of firms competing for the labor services of identical workers.

Why Were Poverty Rates So High in the 1980s?

Rebecca M. Blank

Working Paper No. 3878

October 1991

JEL Nos. I30, E32, J31

This paper explores the relationship between the macroeconomy and the poverty rate. The first section shows that poverty was far less responsive to macroeconomic growth in the 1980s than it had been in earlier decades. This is almost entirely because of declines in real wages that occurred among low-wage workers over the 1980s. In fact, employment and weeks of work per year within low-income households expanded more rapidly in the 1980s than in the 1960s. However, this was offset almost entirely by declines in weekly earnings at the bottom of the income distribution. The result is that economic growth has been a far less effective anti-poverty tool over the past decade than before.

Why Does the Paper-Bill Spread Predict Real Economic Activity?

Benjamin M. Friedman and Kenneth N. Kuttner

Working Paper No. 3879

October 1991

JEL No. E44

Evidence based on the past three decades of U.S. experience shows that the difference between the interest rates on commercial paper and Treasury bills has been consistently and systematically related to subsequent fluctuations in nonfinancial economic activity. This interest rate spread typically widens in advance of recessions, and narrows again before recoveries. The relationship is valid even after allowing for other financial variables that previous researchers have advanced as potential business cycle predictors.

This paper provides support for three different explanations for this predictive power of the paper-bill spread. First, changing perceptions of default risk exert a clearly recognizable influence on the spread. This influence is all the more discernable after allowing for the effects of the changing volume of paper issuance, when investors view commercial paper and Treasury bills as imperfect portfolio substitutes—a key assumption that the evidence introduced here supports.

Second, again under conditions of imperfect substitutability, a widening paper-bill spread also is a symptom of the contraction in bank lending caused by tight monetary policy.

Third, there also is evidence of a further role for independent changes in the behavior of borrowers in the commercial paper market because of their changing cash requirements over the course of the business cycle.

Are Real House Prices Likely to Decline by 47 Percent?

Patric H. Hendershott

Working Paper No. 3880

October 1991

JEL Nos. R31, R21

Mankiw and Weil have estimated a demographically driven equation for real house prices using annual data for 1947–87. They forecast that real house prices will decline by 47 percent over 1988–2007. But their equation really fits data only from the 1950s and 1960s. Not only is the post-1970 fit poor, but the cumulative in-sample forecast for 1970–87 is off by a factor of four. While real house prices seem more likely to decline than to increase over the next two decades, the most likely decline is 10 to 15 percent, not 47 percent.

From Sharp Stabilization to Growth: On the Political Economy of Israel's Transition

Michael Bruno

Working Paper No. 3881

October 1991

This paper considers the interplay of the design and execution of stabilization policy and structural reform

with the role of various agents and pressure groups in a democracy. The context is the political economy of Israel's transition from a successful stabilization to a renewed growth process whose sustainability is yet to be attained. There is particular emphasis on the role of central bank independence, the fight over the budget, the role of the exchange rate in the aftermath of a sharp stabilization, and the process of financial and capital market reform.

The analysis was done from the point of view and temporary role of an academic as a policymaker, in this case as the governor of the central bank and senior advisor to the government.

Pension Substitution in the 1980s: Why the Shift Toward Defined-Contribution Pension Plans?

Douglas L. Kruse

Working Paper No. 3882

October 1991

The relative decline of defined-benefit (DB) pension plans, and the growth of defined-contribution (DC) plans, often has been noted but not explored extensively. This paper reports on the construction of a new longitudinal company-based dataset on pension plans for 1980–6 (including all U.S. companies with large plans, and a 10 percent sample of companies with small plans, within this period).

Among the findings are that the decline in DB coverage primarily is caused by fewer participants in companies maintaining such plans, while very little of the growth in DC coverage is the result of companies terminating DB plans. Also, analysis of manufacturing company choices indicates that the higher administrative costs of DB plans play a statistically significant, but small, role in their decline, while new pension adopters in less stable industries are more likely to choose DC plans.

Do Labor Markets Provide Enough Short-Hour Jobs? An Analysis of Work Hours and Work Incentives

James B. Rebitzer and Lowell J. Taylor

Working Paper No. 3883

October 1991

JEL No. J2

This paper examines the role of work incentives in the determination of work hours. Following previous research by Lang (1989), we use a conventional efficiency wage model to analyze how firms respond to worker preferences regarding wage-hours packages. We find that when workers are homogeneous, the role of worker preferences in determining work hours is similar to the simple neoclassical model of labor supply. For instance, if worker preferences shift in favor of shorter hours, firms will respond by offering jobs entailing shorter hours.

When workers have heterogeneous preferences, however, employers will want to use a worker's preferences for hours as a signal for the responsiveness of the worker to the work incentives offered by the firm. Workers in turn may not reveal their hours preferences. Our key finding in this instance is that the labor market equilibrium may be characterized by a suboptimal number of short-hour jobs. This shortage of short-hour jobs is likely to be found in high-wage labor markets.

National Health Insurance Revisited

Victor R. Fuchs

Working Paper No. 3884

October 1991

JEL No. I18

This paper explains why one in seven Americans has no health insurance, and compares the casualty and the social insurance models of health insurance. I discuss the relationship among national health insurance (NHI), the cost of care, and the health of the population, and consider the prospects for NHI in the United States in the short and the long run. Four explanations for the absence of NHI in the United States—distrust of government, heterogeneity of the population, a robust voluntary sector, and lack of noblesse oblige—are evaluated in the light of recent political, social, and economic trends.

The Reincarnation of Keynesian Economics

N. Gregory Mankiw

Working Paper No. 3885

October 1991

JEL No. E00

This paper discusses the reemergence of Keynesian economics during the past decade. It highlights the substantial differences between new Keynesian economics and the convictions of early Keynesians. In particular, it points out that new Keynesians have adopted many views that once were considered "monetarist" or "classical." It concludes that the term "Keynesian" may have outlived its usefulness.

Leapfrogging: A Theory of Cycles in National Technological Leadership

Elise Brezis, Paul R. Krugman, and Daniel Tsiddon

Working Paper No. 3886

October 1991

JEL Nos. D90, F12

Much recent work has suggested that endogenous technological change tends to reinforce the position

of the leading nations. Yet from time to time this leadership role shifts. We suggest a mechanism that explains this pattern of "leapfrogging" as a response to occasional major changes in technology. When such a change occurs, leading nations may have no incentive to adopt the new ideas. Given their extensive experience with older technologies, the new ideas initially do not seem to be an improvement. Lagging nations, however, have less experience. The new techniques offer them an opportunity to use their lower wages to break into the market. If the new techniques eventually prove to be more productive than the old, then there is a reversal of leadership.

The Effects of Public Infrastructure and R and D Capital on the Cost Structure and Performance of U.S. Manufacturing Industries

Theofanis P. Mamuneas and M. Ishaq Nadiri

Working Paper No. 3887

October 1991

JEL Nos. D24, H40, H54, H59

We examine the effects of publicly financed infrastructure and R and D capital on the cost structure and productivity of 12 two-digit U.S. manufacturing industries. We find that there are significant productive effects from these two types of capital. Their effects on the cost structure vary across industries, and their contributions to growth of labor productivity vary over time. Not only is the cost function shifted downward in each industry, generating productivity inducement, but the factor demand in each industry also is affected by the two types of public capitals, suggesting bias effects. We also calculate the marginal benefits of these services in each industry, and estimate the "social" rates of return to these capitals for the industries in the sample.

An Ordered Probit Analysis of Transaction Stock Prices

Jerry A. Hausman, Andrew W. Lo, and A. Craig MacKinlay

Working Paper No. 3888

October 1991

JEL No. G12

We investigate the conditional distribution of trade-to-trade price changes using *ordered probit*, a statistical model for discrete random variables. This approach takes into account the fact that transaction price changes occur in discrete increments, typically eighths of a dollar, and at irregularly spaced intervals. Unlike existing continuous-time/discrete-state models of discrete

transaction prices, ordered probit can capture the effects on price changes of other economic variables, such as volume, past price changes, and the time between trades.

Using data on 1988 transactions for over 100 randomly chosen U.S. stocks, we estimate the ordered probit model via maximum likelihood. We then use the parameter estimates to measure several transaction-related quantities, such as the price impact of trades of a given size, the tendency toward price reversals from one transaction to the next, and the empirical significance of price discreteness.

Private Beliefs and Information Externalities in the Foreign Exchange Market

Richard K. Lyons

Working Paper No. 3889

October 1991

JEL Nos. F13, G15, G14

There is an information externality in the foreign exchange market because traders play two partially conflicting roles: each is a speculator; and each is an information clearinghouse, intermediating orders for its customers that convey information. Profit maximization induces traders to weigh fundamental information too lightly in making their trades, reducing the degree to which prices reveal information at any given time.

Labor Demand: What Do We Know? What Don't We Know?

Daniel S. Hamermesh

Working Paper No. 3890

November 1991

JEL No. J23

This study reviews empirical research on the demand for labor. For example, it discusses the distinction between workers and hours; the importance of job dynamics; and the nature of a variety of policies that affect the long-run demand for labor. This paper emphasizes how the paucity of appropriate data has limited our ability to obtain reliable estimates of the underlying concepts.

The Role of Federal Taxation in the Supply of Municipal Bonds: Evidence from Municipal Governments

Gilbert E. Metcalf

Working Paper No. 3891

November 1991

JEL Nos. H70, H74

The tax treatment of municipal bonds and income creates an arbitrage opportunity for communities to issue tax-exempt debt and invest in financial assets. I show that the rules in effect prior to 1986 to prevent this activity were not effective. I then develop and estimate a model of municipal bond supply. I find a semi-elasticity of 1.23 of long-term debt with respect to the spread between the aftertax rate of return and the municipal borrowing rate.

Monetary Policy, Business Cycles, and the Behavior of Small Manufacturing Firms

Mark Gertler and Simon Gilchrist

Working Paper No. 3892

November 1991

JEL Nos. E3, E4, E5

We present evidence on the cyclical behavior of small versus large manufacturing firms, and on the response of the two classes of firms to monetary policy. We hope to quantify the role of credit market imperfections in the business cycle and in the monetary transmission mechanism.

We find that, following a period of tight money, small firms' sales decline at a faster pace than large firms' sales for more than two years. Further, bank lending to small firms contracts, while it actually rises for large firms. Monetary policy indicators tied to the performance of banking, such as M2, have relatively greater predictive power for small firms than for large firms. Finally, small firms are more sensitive than large firms to lagged movements in GNP. Considering that small firms are not a trivial component of the economy, we believe that credit market imperfections have macroeconomic relevance.

Productivity Gains from the Implementation of Employee Training Programs

Ann P. Bartel

Working Paper No. 3893

November 1991

JEL No. J24

I use data on the personnel policies and economic characteristics of businesses in the manufacturing sector to study the relationship between employee training and labor productivity. My main finding is that businesses that were operating below their expected labor productivity levels in 1983 implemented new employee training programs after 1983 that resulted in significantly larger increases in labor productivity growth between 1983 and 1986 than before. This higher rate of productivity growth was sufficient to bring these businesses up to the productivity levels of comparable businesses by 1986. The positive effects of training implementation on productivity growth are inconsistent with a "Hawthorne Effect" interpretation, because the implementation of new personnel policies other than training did *not* have significant effects on productivity growth.

Continuous versus Episodic Change: The Impact of Civil Rights Policy on the Economic Status of Blacks

John Donohue and James J. Heckman

Working Paper No. 3894

November 1991

JEL No. J15

This paper examines the available evidence on the causes of black economic advancement in order to

assess the contribution of federal policy. From 1920–90, there were only two periods of relative economic improvement for blacks: the 1940s; and the decade following the passage of the Civil Rights Act of 1964, the Voting Rights Act of 1965, and the institution of the federal contracts compliance program. Black migration from the South, a traditional source of economic gains for blacks, almost stopped at about this same time. Recent evidence indicates that educational gains cannot explain the magnitude of black economic progress beginning in the mid-1960s.

Taxation and Foreign Direct Investment in the United States: A Reconsideration of the Evidence

Alan J. Auerbach and Kevin Hassett

Working Paper No. 3895

November 1991

JEL Nos. F21, H87

Foreign direct investment (FDI) in the United States boomed in the late 1980s. Some have attributed this rise to the Tax Reform Act of 1986, which, by discouraging investment by domestic firms, may have provided opportunities for foreign firms not affected as strongly by the U.S. tax changes. We challenge this view and find that: while the argument applies to new capital investment, the boom was primarily in mergers and acquisitions; while the argument holds primarily for investment in equipment, there was no shift toward the acquisition of equipment-intensive firms; and the boom in FDI in the United States was really part of a worldwide boom in FDI. The U.S. share of outbound FDI from other countries did not increase during 1987–9.

Moderate Inflation

Rudiger Dornbusch and Stanley Fischer

Working Paper No. 3896

November 1991

JEL No. E31

Inflation persists at moderate rates of 15–30 percent in all the countries that successfully reduced triple-digit inflation in the 1980s. Several other countries, for example Colombia, have experienced moderate inflation for prolonged periods.

In this paper, we first set out theories of persistent inflation. They can be classified as those emphasizing seigniorage as a source of government finance, and those emphasizing the costs of ending inflation.

We then examine the sources and persistence of episodes of moderate inflation. Most were triggered by commodity price shocks; they were brief; and very few ended in higher inflation.

We then present case studies of eight countries, including three that now suffer from moderate inflation,

and four that successfully moved down to single-digit inflation rates. We examine the roles of seigniorage, indexation and disindexation, the exchange rate commitment, and monetary and fiscal policy. The evidence suggests that, at most, seigniorage plays a modest role in the persistence of moderate inflations, and that such inflations can be reduced only at a substantial short-term cost to growth.

Does Employer Monopsony Power Increase Occupational Accidents? The Case of Kentucky Coal Mines

Shulamit Kahn

Working Paper No. 3897

November 1991

JEL Nos. J28, C72

Labor Studies

A popular argument for safety regulations is that workers accept dangerous jobs because they have no choice or, in other words, because they have few or no alternative employment opportunities. I consider this argument and analyze the effect of additional firms on occupational safety. With a particular functional specification, I find that additional firms (except for the second entrant) will lower accident rates, thus increasing occupational safety. However, with other functional specifications, the results could be different.

As a result, I investigate the effect of monopsony power for a labor market that is likely to be particularly susceptible to monopsony: nonunionized Kentucky coal mines in the late 1970s. I show that areas with many choices of alternative employers within easy driving distance do have lower accident rates. For this labor market, at least, when more alternatives in the same occupation are offered, average levels of occupational safety increase. Policies that improve occupational mobility and the competitiveness of labor markets, therefore, may improve occupational safety simultaneously.

Pension Funding in the Public Sector

Olivia S. Mitchell and Robert S. Smith

Working Paper No. 3898

November 1991

JEL No. G23

Aging, Labor Studies

This paper explores the determinants of pension funding in the public sector. We use a new dataset that describes financial and other characteristics of state, local, and teacher plans.

The data show that, on average, public sector pension plans were relatively well funded during the late 1980s. There were, however, wide variations in funding practices. Our analysis suggests that past funding practice tends to be perpetuated, that unionized employers are less likely to fund future pension obligations fully, and that funding is sensitive to fiscal pressure.

The Marshall Plan: History's Most Successful Structural Adjustment Program

J. Bradford De Long and **Barry J. Eichengreen**

Working Paper No. 3899

November 1991

JEL Nos. F33, F02, E65, F15, H11, N14

International Studies

The post-World War II reconstruction of Western Europe was one of the greatest economic and foreign policy successes of this century. Folk wisdom assigns the Marshall Plan—the program that transferred some \$13 billion to Europe in 1948–51—a major role in the successful reconstruction.

We examine the economic effects of the Marshall Plan and find that it was not large enough to have accelerated recovery significantly by financing investment, aiding the reconstruction of damaged infrastructure, or easing commodity bottlenecks. We argue, however, that the Marshall Plan *did* play a major role in setting the stage for Western Europe's rapid growth after World War II. The conditions attached to Marshall Plan aid pushed Europe's political economy in a direction that left its post-World War II "mixed economies" with more "market" and fewer "controls."

Which Households Own Municipal Bonds? Evidence from Tax Returns

Daniel R. Feenberg and **James M. Poterba**

Working Paper No. 3900

November 1991

JEL Nos. H74, H24

Taxation

We use data from 1988 federal income tax returns to analyze the distribution of tax-exempt asset holdings. We find that more than three-quarters of the tax-exempt debt of households was held by those with marginal tax rates of 28 percent or more.

We also report two measures of the average marginal tax rate on tax-exempt debt. The first measures the increase in taxes if a small fraction of exempt interest income were converted to taxable interest. This weighted average of "first-dollar" marginal tax rates is 25.8 percent.

We find that if *all* tax-exempt interest were reported as taxable interest, then taxes would rise by 27.6 percent of the increase in taxable interest. Thus many taxpayers who receive substantial sums of tax-exempt interest, but have low first-dollar marginal tax rates, would be driven into higher tax brackets if the exemption were eliminated while their portfolios remained the same.

Changes in Earnings Differentials in the 1980s: Concordance, Convergence, Causes, and Consequences

McKinley L. Blackburn, **David E. Bloom**, and **Richard B. Freeman**

Working Paper No. 3901

November 1991

Labor Studies

This paper analyzes changes in U.S. earnings differentials in the 1980s between race, gender, age, and schooling groups.

First, we find that the economic position of less-educated workers declined relative to the more-educated among almost all demographic groups. Education-earnings differentials clearly rose for whites, but the result was less clear for blacks. Employment rate differences associated with education increased more for blacks than for whites.

Second, much of the change in education-earnings differentials for specific groups is attributable to specific economic factors: changes in occupational or industrial structure of employment; changes in average wages within industries; the fall in the real value of the minimum wage; the fall in union density; and changes in the relative growth rate of more-educated workers.

Third, across education groups the earnings and employment position of white females, and black females to a lesser extent, converged to the position of white males in the 1980s. At the same time, the economic position of more-educated black males appears to have worsened relative to their white male counterparts.

Fourth, there has been a sizable response in college enrollment to the rising relative wages of college graduates. This response suggests that education-earnings differentials may stop increasing, or even start to decline, in the near future.

Corporate Financial Policy, Taxation, and Macroeconomic Risk

Mark Gertler and **R. Glenn Hubbard**

Working Paper No. 3902

November 1991

JEL Nos. E44, H3, G3

Corporate Finance, Taxation

In this paper, we attempt to rationalize why firms designing an optimal capital structure would choose a level of debt that leaves them heavily exposed to macroeconomic risk (excessive leverage). We take into account common risks, interpretable as business cycle risks, as well as idiosyncratic risks. We also consider corporate and investor-level taxes, and the implications of a net tax bias against equity finance. The tax distortion confronts firms with a trade-off between the costs of equity finance and the costs of increased exposure to the macroeconomic risk that accompanies debt finance. In this way, "excessive leverage" is a possible outcome. Further, despite the possibility of renegotiation, debt in general is less effective than equity in insulating the firm against aggregate risk.

We predict that individual firm dividends may vary with macroeconomic conditions, even after controlling for the effects of relevant measures of firm-specific performance, such as earnings.

Productivity and Machinery Investment: A Long-Run Look, 1870-1980

J. Bradford De Long

Working Paper No. 3903

November 1991

JEL No. N10

Growth

Over the past century, the long-run growth of six economies shows a strong association between investment in machinery and economic growth. This holds both within and across nations and periods. A similar strong association holds for post-World War II for a broader cross section of nations. A number of considerations suggest that this association is causal, and that a high rate of investment in machinery is a necessary prerequisite for rapid long-run growth in productivity.

Taxation of Labor Income and the Demand for Risky Assets

Douglas W. Elmendorf and Miles S. Kimball

Working Paper No. 3904

November 1991

Taxation

We analyze the effect of risk to uninsured labor income on the joint saving-portfolio composition decision. We also consider the effect of taxes on labor income on the demand for risky securities. It is well known that when private insurance markets are incomplete, the insurance afforded by taxes on labor income can reduce overall saving. This paper establishes that the insurance afforded by taxes on labor income also increases the demand for risky securities, even when labor income is independent of the returns to risky securities.

Productivity Gains from Geographic Concentration of Human Capital: Evidence from the Cities

James E. Rauch

Working Paper No. 3905

November 1991

JEL Nos. O40, R10

Growth

I argue that the average level of human capital is a local public good. Therefore, cities with higher levels

of human capital should have higher wages and higher land rents. This prediction is supported by data for Standard Metropolitan Statistical Areas (SMSAs) in the United States, where the SMSA average levels of formal education and work experience are used as proxies for the average level of human capital. I evaluate the alternative explanations of omitted SMSA variables and self-selection. I conclude by computing an estimate of the effect of an additional year of average education on total factor productivity.

A Theory of Debt Based on the Inalienability of Human Capital

Oliver Hart and John Moore

Working Paper No. 3906

November 1991

JEL Nos. G32, G33, D23

Corporate Finance

Suppose an entrepreneur needs to raise funds from an investor, but cannot commit to keeping his human capital in the project. Then the possibility of a default, or quit, puts an upper bound on the total future indebtedness of the entrepreneur to the investor. We characterize the optimal path of repayment and show how it is affected both by the maturity structure of the project's stream of returns and by the durability and specificity of the project's assets. Our results are consistent with the conventional wisdom about what determines the maturity structure of (long-term) debt contracts.

Liquidity Constraints and Intertemporal Consumer Optimization: Theory and Evidence from Durable Goods

Eun Young Chah, Valerie Ramsey, and Ross M. Starr

Working Paper No. 3907

November 1991

JEL No. E21

Economic Fluctuations

We test a new set of stochastic implications of optimal consumption behavior in the presence of borrowing constraints. Unlike previous models, our theory shows that liquidity constraints imply a distinctive relationship over time between consumption of durable and nondurable goods.

The presence of binding liquidity constraints is part of an error-correction term from the long-run cointegrating relationship between durables and nondurables. The error-correction term will predict the future change in nondurable consumption.

Empirical tests of these implications, using aggregate data, confirm that liquidity constraints, rather than rule-of-thumb behavior, best explain the excess sensitivity of consumption to predictable changes in income.

Pension COLAs

Alan L. Gustman and Thomas L. Steinmeier

Working Paper No. 3908

November 1991

JEL Nos. J14, J26, J32

Aging, Labor Studies

This paper studies cost-of-living adjustments (COLAs) in pensions from the perspective of labor economics. Evidence on the pension and annuity incomes of retirees suggests that pension COLAs were less important in the 1980s than in the 1970s. Still, through 1987, COLAs covered about half of the cost-of-living increases. Data on pension benefit formulas and COLA provisions from a sample of the 50 largest industrial companies indicate that if the inflation of 1968-78 had persisted, then COLAs would increase basic pension benefits for retirees by half. If, instead, inflation had continued at 1978-88 levels, pension COLAs would raise the present value of pensions by only 14 percent.

We also find that pension COLAs have very little effect on retirement, turnover, or shirking. Finally, when the contribution side of COLAs is taken into account, pension COLAs do not necessarily dampen the variation among generations in real incomes received under alternative inflation shocks.

Alcoholism, Work, and Income over the Life Cycle

John Mullahy and Jody L. Sindelar

Working Paper No. 3909

November 1991

JEL Nos. J24, I12

Health Economics, Labor Studies

We find that alcoholism decreases participation in the labor force among prime-age males, and therefore decreases this group's income. The effects of alcoholism on the labor force participation of younger and older males, and on the wage rates of prime-age males, are not generally significant. We also find that alcoholism affects income indirectly through its effects on individual characteristics such as schooling and marital status, as well as directly through labor force participation rates.

Are Option-Implied Forecasts of Exchange Rate Volatility Excessively Variable?

Jeffrey A. Frankel and Shang-Jin Wei

Working Paper No. 3910

November 1991

JEL Nos. G15, F31, G14

Asset Pricing, International Studies

Market participants' forecasts of exchange rate volatility can be recovered from option contracts on foreign currencies. We use these implicit forecasts of volatility for four currencies to test whether participants have rational expectations.

First, we examine and reject the proposition that the market's anticipated one-month-ahead standard deviation is an unbiased estimator of the subsequent realized standard deviation. The implicit forecasts themselves are excessively variable, and the rejection is not caused by nonnormality of the error term.

Second, we test a weaker version of market rationality: that the market can forecast the direction of the change in exchange rate volatility correctly. We confirm this weaker version of rationality.

Third, we investigate how market forecasts are formed. We find that some market participants weigh lagged volatility heavily when forecasting future volatility.

Finally, some of our results further support the finding that when the market predicts a large deviation of volatility from its mean, it could do better by moderating its forecast.

Do Bulls and Bears Move Across Borders? International Transmission of Stock Returns and Volatility as the World Turns

Robert F. Engle III, Takatoshi Ito, and Wen-Ling Lin

Working Paper No. 3911

November 1991

JEL Nos. C51, F36, G15

Asset Pricing, International Studies

This paper empirically investigates how returns and volatilities of stock indexes are correlated between Tokyo and New York. We use intradaily data so that daytime and overnight returns are defined for both markets. Tokyo daytime hours overlap with New York overnight hours, while New York daytime hours overlap with Tokyo overnight hours.

We find that Tokyo (New York) daytime returns in general are significantly correlated with New York (Tokyo) overnight returns. This suggests that information revealed during the trading hours of one market has a global impact on the returns of the other market. One exception is that after the October 1987 crash, the Tokyo overnight returns were not affected significantly by New York daytime returns. This is the problem of setting the opening price of a domestic market conditional on the foreign daytime returns. We also investigate lagged-return and volatility spillovers. Except for a lagged-return spillover from New York to Tokyo for the period after the crash, there are no significant lagged spillovers in returns or in volatilities.

Estimating the Effect of Training on Employment and Unemployment Durations: Evidence from Experimental Data

John C. Ham and Robert LaLonde

Working Paper No. 3912

November 1991

Labor Studies

Using data from a social experiment, we estimate the impact of training on the duration of employment and

unemployment spells for recipients of Aid to Families with Dependent Children. Although an experimental design eliminates the need to construct a comparison group for this analysis, simple comparisons between the average durations, or the transition rates, of employment and unemployment spells for those receiving "treatment" and a control group lead to biased estimates of the effects of training. We present and implement several econometric approaches that demonstrate the importance of these biases, and we correct for them. We find that the training programs we study raised employment rates because employment durations increased. In contrast, training did not lead to shorter unemployment spells.

Borrowing Constraints and Two-Sided Altruism with an Application to Social Security

David Altig and Steve J. Davis

Working Paper No. 3913

November 1991

JEL Nos. D91, H55

Taxation

We develop the implications of borrowing constraints and two-sided altruism in an overlapping-generations framework with agents who live for three periods. There are six equilibrium patterns of intertemporal and intergenerational linkages in the no-loan economy; one corresponds to the traditional life-cycle model, and one to Barro's dynastic model. Novel linkage patterns involve parent-to-child transfers early in the life cycle, child-to-parent gifts late in the life cycle, or both. Capital accumulation behavior and the consequences of fiscal policy interventions depend, often critically, on which linkage patterns prevail. We show how unfunded Social Security interventions can depress aggregate capital accumulation significantly, even when every generation is linked to its successor generation by altruistic transfers. We also derive a result for gift-motive economies that holds whether or not borrowing constraints bind and whether or not parent and child are connected by an operative altruism motive at all points in the life cycle.

Environmental Impacts of a North American Free Trade Agreement

Gene M. Grossman and Alan B. Krueger

Working Paper No. 3914

November 1991

JEL Nos. F13, Q2

International Studies

Generally, a reduction in trade barriers will affect the environment by expanding the scale of economic

activity, altering the *composition* of economic activity, and bringing about a change in the *techniques* of production. We assess the relative magnitudes of these three effects as they apply to further trade liberalization in Mexico.

First, to study the relationship between air quality and economic growth, we use comparable measures of three air pollutants in a cross section of urban areas located in 42 countries. We find for two of the pollutants (sulfur dioxide and "smoke") that concentrations increase with per capita GDP growth at higher levels of income.

We then study the determinants of the industry pattern of U.S. imports from Mexico, and of value added by Mexico's maquiladora sector. We investigate whether the size of pollution abatement costs in the U.S. industry influences the pattern of international trade and investment. Finally, we use the results from a computable general equilibrium model to study the likely compositional effect of a North American Free Trade Agreement on pollution in Mexico.

Social Security and Medicare Policy from the Perspective of Generational Accounting

Alan J. Auerbach, Jagadeesh Gokhale,

and **Laurence J. Kotlikoff**

Working Paper No. 3915

November 1991

JEL No. H22

Aging, Taxation

Our previous study, NBER Reprint No. 1636 (October 1991), introduced the concept of "generational accounting," a method of determining how the burden of fiscal policy falls on different generations. We found that fiscal policy in the United States is out of balance in terms of projected generational burdens. That is, either current generations will bear a larger share (than we project under current law) of the burden of the government's spending, or future generations will have to pay, on average, at least 21 percent more (on a growth-adjusted basis) than those generations that have just been born.

These conclusions were based on relatively optimistic assumptions about the path of Social Security and Medicare, namely that the accumulation of a Social Security trust fund would continue, and that Medicare costs would not rise as a share of GNP.

In this paper, we simulate the effects of realistic alternative paths for Social Security and Medicare. Our results suggest that such alternative policies could greatly increase the imbalance in generational policy, making both future generations and current young Americans pay significantly more. For example, if the bill for Medicare growth is shifted primarily to future generations, then continued expansion of Medicare in this decade alone could double the 21 percent imbalance figure.

The Impact of Terms of Trade Shocks on a Small Open Economy: A Stochastic Analysis

Stephen J. Turnovsky

Working Paper No. 3916

November 1991

JEL Nos. F41, F43

International Studies

This paper investigates the impact of change in the terms of trade on the economic performance of a small economy. I discuss the effects of both unanticipated shocks and the changes in the mean and variance of the probability distribution generating these shocks. In all cases, the key to determining the response of the economy is the effect on the rate of growth of real wealth, to which all other real quantities are tied directly in equilibrium.

The Currency Reform as the Last Stage of Economic and Monetary Union: Some Policy Questions

Alberto Giovannini

Working Paper No. 3917

November 1991

JEL Nos. F15, F36, F02, F33

International Studies

This paper discusses the policy problems of a project aimed at substituting a single currency for several national currencies. While these problems are of general interest, this analysis is motivated by the plan for Economic and Monetary Union among the members of the European Community. I discuss the choice of conversion rates, and the effects of exchange rate devaluations at the time of the monetary reform.

Devaluation Expectations: The Swedish Krona, 1982-91

Hans Lindberg, Paul Söderlind,

and **Lars E. O. Svensson**

Working Paper No. 3918

November 1991

JEL Nos. F31, F33

International Studies

We estimate devaluation expectations for the Swedish krona for 1982-91. The "simplest test" is applied under either the minimal assumption of "no positive minimum profit" only, or the additional assumption of uncovered interest parity. Then we use a more precise method suggested by Bertola and Svensson, in which expected rates of depreciation within the exchange rate band are subtracted from interest rate differentials. We also estimate the probability density of the time of devaluations. Finally, we explain estimated devaluation expectations with a few macrovariables and parliamentary elections.

Speculative Attacks and Models of Balance-of-Payments Crises

Pierre-Richard Agenor, Jagdeep S. Bhandari,

and **Robert P. Flood**

Working Paper No. 3919

November 1991

JEL Nos. F30, F31

International Studies

This paper reviews recent developments in the theoretical and empirical analysis of balance-of-payments crises. First we develop a simple analytical model highlighting the process leading to such crises. Then we extend the basic framework to deal with a variety of issues including alternative post-collapse regimes; uncertainty; real sector effects; external borrowing and capital controls; imperfect asset substitutability; sticky prices; and endogenous policy switches. We also examine empirical evidence on the collapse of exchange rate regimes and discuss the major implications of the analysis for macroeconomic policy.

Identification and the Liquidity Effect of a Monetary Policy Shock

Lawrence J. Christiano and Martin S. Eichenbaum

Working Paper No. 3920

November 1991

JEL Nos. I31, E32

Economic Fluctuations, Monetary Economics

Conventional wisdom holds that unanticipated, expansionary shocks to monetary policy cause decreases in real and nominal interest rates. However, a number of econometric studies argue that the opposite is true: that these shocks actually raise, rather than lower, short-term interest rates. We show that that conclusion depends on the monetary aggregate used, or the assumptions used to identify monetary policy disturbances. For example, using nonborrowed reserves as the aggregate, we find strong evidence in favor of the conventional view. Challenges to that view lack credibility because they are based on measures of policy disturbances that generate implausible implications about factors other than interest rates.

Bank Runs: Liquidity and Incentives

Russell Cooper and Thomas W. Ross

Working Paper No. 3921

November 1991

JEL Nos. E44, E50, D84

Economic Fluctuations

Diamond and Dybvig (1983) provide a model of intermediation in which bank runs are driven by pessi-

mistic expectations of depositors. Models that address these issues are important in the ongoing discussion weighing the costs (incentive problems) and benefits (preventing runs) of deposit insurance.

This paper extends the Diamond-Dybvig analysis to consider several important questions for evaluating deposit insurance that could not be addressed within their framework. First, we provide conditions for runs when banks can invest in both illiquid and liquid projects. This results in a weakening of the conditions necessary for bank runs relative to the Diamond-Dybvig model, in which no liquid investments occur in equilibrium.

Second, we characterize the response of banks to the possibility of runs through their design of deposit contracts and investment decisions, and particularly through the holding of excess reserves.

Finally, we use this framework to evaluate the costs and benefits of deposit insurance and other forms of intervention. To do so, we introduce moral hazard and monitoring into the model and explore the incentive effects of deposit insurance. Implementing a capital requirement along with deposit insurance can support the optimal allocation.

The Cleansing Effect of Recessions

Ricardo J. Caballero and Mohamad L. Hammour

Working Paper No. 3922

December 1991

JEL Nos. E10, E22, E24, E32

Economic Fluctuations

This paper investigates the response of industries to cyclical variations in demand. Because of process and product innovation, production units that embody the newest techniques are being created continuously, and outdated units are being destroyed. We investigate the extent to which changes in demand are accommodated on the creation or destruction margins. Although outdated production units are the most likely to turn unprofitable and be scrapped in a recession, they can be "insulated" from the fall in demand if it is accompanied by a reduction in the rate of creation. The model's implications are broadly consistent with observed variations in gross job flows in manufacturing. The calibrated model matches the relative volatilities of job creation and destruction, and their asymmetries over the cycle.

Organizational Failure and Incentive Contracts in the Public Sector: Evidence from an Experiment in the Financing of Public Health Care

Richard G. Frank and Martin Gaynor

Working Paper No. 3923

December 1991

JEL Nos. H7, I1

Health Economics

This paper uses a unique "natural experiment" in the design of intergovernmental grants: Ohio has dramati-

cally altered the method by which local public mental health care is financed, allowing for the estimation of income-compensated-subsidy responses of local governmental entities. We find strong responses to the "new" incentives, suggesting a direction for policy-makers in dealing with some of the most vexing problems in mental health policy.

Income Shifting in U.S. Multinational Corporations

Davis Harris, Randall Mørck, Joel B. Slemrod, and Bernard Yeung

Working Paper No. 3924

December 1991

JEL Nos. H25, F23

Taxation

Using a five-year panel of data for 200 large U.S. manufacturing firms, we find that U.S. tax liability, as a fraction of either U.S. sales or U.S. assets, is related to the location of foreign subsidiaries in a way that is consistent with tax-motivated income shifting. Having a subsidiary in a tax haven, Ireland, or one of the "four dragon" Asian countries—all characterized by low tax rates—is associated with lower U.S. tax ratios. Having a subsidiary in a high-tax region is associated with higher U.S. tax ratios.

These results suggest that U.S. manufacturing companies shift income out of high-tax countries into the United States, and from the United States to low-tax countries. Such behavior certainly lowers worldwide tax liabilities for larger U.S. manufacturing companies and appears to lower their U.S. tax liabilities significantly.

The Effects of U.S. Tax Policy on the Income Repatriation Patterns of U.S. Multinational Corporations

Rosanne Altshuler and T. Scott Newlon

Working Paper No. 3925

December 1991

JEL Nos. H25, H87

Taxation

U.S. corporations owe taxes to the U.S. Treasury on income earned both inside and outside American borders. This paper examines the incentives created by the U.S. tax system for the legal avoidance of taxes on foreign source income. Using data from 1986 corporate tax returns, we investigate the extent to which U.S. corporations structure and coordinate remittances of income from their foreign subsidiaries to reduce their U.S. and foreign tax liabilities. In contrast to previous work in this area, our estimates of the tax consequences of income remittances from foreign subsidiaries to parent corporations explicitly take into account: the ability to use foreign tax credits generated from one

source of foreign income to offset the U.S. tax liability generated by other sources of foreign income; withholding tax rates on income remittances; variations in source country corporate income tax systems; and dynamic aspects of the U.S. tax system. We find that U.S. multinationals are able to take advantage of the U.S. tax system to avoid paying much U.S. tax on their foreign source income.

Labor Market Institutions, Liquidity Constraints, and Macroeconomic Stability

Frank R. Lichtenberg

Working Paper No. 3926

December 1991

JEL Nos. E32, J23

Labor Studies

The sensitivity of employment and real wages, and hence aggregate labor income, to short-run fluctuations in output varies across countries. I develop a simple theoretical model to show that, if workers (but not capitalists) are liquidity constrained, then the economy's sensitivity to exogenous expenditure shocks is related inversely to the extent to which capitalists (not workers) bear fluctuations in income.

I test this proposition using cross-sectional, country-level data on elements of the (time-series) covariance matrix of output, employment, real wages, and investment. For two reasons, my estimate of the elasticity of consumption with respect to labor income is likely to be biased toward zero. Nevertheless, this parameter is quite significantly different from zero, and is consistent with previous estimates (obtained from a completely different specification).

I conclude that, the lower the sensitivity of labor income to output fluctuations, the smaller the output fluctuations will be. Low sensitivity contributes indirectly as well as directly to the stability of labor income.

Changes in Relative Wages, 1963-87: Supply-and-Demand Factors

Lawrence F. Katz and Kevin M. Murphy

Working Paper No. 3927

December 1991

JEL Nos. J31, J23

Labor Studies

We use a simple supply-and-demand framework to analyze changes in the U.S. wage structure from 1963-87. Rapid secular growth in the demand for workers who are more educated and "more skilled," and for females, appears to be the driving force behind observed changes in the wage structure. Throughout the period, measured changes in the allocation of labor between industries and occupations strongly favored college graduates and females. Movements in the college wage premium over this period appear to be related strongly to fluctuations in the rate of growth of the supply of college graduates.

The Appointment-Book Problem and Commitment, with Applications to Refereeing and Medicine

Daniel S. Hamermesh

Working Paper No. 3928

December 1991

JEL Nos. D45, J20

Labor Studies

I study markets that involve customers waiting for services or goods in queues of unobservable length. In these markets, suppliers truncate queues that become so long that they jeopardize future relationships with the customer. The length of the queue and the probability of truncation increase with the quality of the supplier. This implicitly defines the price that customers are willing to pay for higher quality. Queue-jumping or nontruncation can occur if monetary payments are made, or if nonmonetary specific commitments exist between a customer and a supplier. The predictions apply to any activity in which the queue is unobservable and transactions costs make contracts or spot pricing uneconomic.

I examine the theory on a random sample of refereeing requests by seven economics journals. Quality, measured by experience and citations to the referees' work, lengthens the queue and increases the probability of truncation. Monetary bribes affect queue discipline in the expected way. Specific commitments, measured by past publication in the journal and location at the editor's institution, greatly affect the truncation rate, but have no impact on the rate of servicing the queue. I also examine the implications for truncation on a dataset describing doctors' willingness to accept new patients with much the same results as in the sample of referees.

How Does It Matter?

Benjamin M. Friedman

Working Paper No. 3929

December 1991

JEL No. E52

Monetary Economics

This paper argues that the distinctions among different current theories of the business cycle do not have the force usually assumed in their behalf in discussions of macroeconomic policy. The distinction between aggregate demand and aggregate supply as the principal location of the disturbances that drive business cycles—the distinction most popularly associated with "real business cycle" models—is less important from a policy perspective than is commonly believed. The policy prescriptions that follow from these models have more to do with the kinds of assumptions that they incorporate about how markets function than with whether the chief economic disturbances work through demand or supply.

At the same time, a set of distinctions not customarily addressed in the business cycle literature, mostly revolving around the definition of "income," turns out to be surprisingly important. Finally, further issues, which traditionally receive too little attention from economists, arise from the fact that the people and the business institutions that make up the private sector of a modern industrialized economy are vastly heterogeneous, and that democratic forms of government, for all their virtues, have not been very effective in arranging appropriate transfers from one group to others as the need arises.

On the Sensitivity of R and D to Delicate Tax Changes: The Behavior of U.S. Multinationals in the 1980s

James R. Hines, Jr.

Working Paper No. 3930

December 1991

JEL Nos. H25, H87, F23

Taxation

This paper explores the effect of recent U.S. tax changes on the R and D of American multinational corporations. Prior to 1986, U.S. multinational firms could deduct all of their domestic R and D expenses against their U.S. income for tax purposes. After 1986, some firms could take only a partial deduction (while other multinationals continued to receive the benefits of 100 percent deductibility). By comparing the behavior of firms in those two situations (after 1986), it is possible to estimate the responsiveness of R and D to changes in aftertax prices.

The results indicate that price elasticity of demand for R and D lies between -1.2 and -1.6 , thereby implying considerably more price sensitivity than is typically assumed to be true of R and D. Based on these results, the 1986 tax change appears to have been responsible for a reduction of between \$1.4 billion and \$2.2 billion in annual R and D in the United States, in return for \$1.2 billion in additional annual tax revenue.

How Long Do Unilateral Target Zones Last?

Bernard Dumas and Lars E. O. Svensson

Working Paper No. 3931

December 1991

JEL Nos. F31, F33

International Studies

We examine the expected survival time of a unilateral exchange rate target zone, when constraints on monetary policy prevent the central bank from focusing exclusively on defending the target zone. Generally, the width of the target zone has a negligible effect on the expected survival time. The dominant determinants are reserve levels and the degree of real and monetary divergence between the country in question and the rest of the world. For seemingly realistic parameters, the expected survival time is fairly long: a few decades rather than a few years.

Consumption Taxes in a Life-Cycle Framework: Are Sin Taxes Regressive?

Andrew B. Lyon and Robert M. Schwab

Working Paper No. 3932

December 1991

JEL No. H22

Taxation

We construct measures of tax incidence over the life cycle and compare them to traditional measures based on annual data. Annual measures of the incidence of taxes on consumption goods may differ from life-cycle measures for three reasons. First, annual measures of income reflect transitory components that should have smaller effects on consumption than permanent changes in income do. Second, income measured in a single period differs from lifetime income because of age-related differences in earnings. Third, consumption of certain items follows life-cycle patterns independent of changes in income. Surprisingly, we find that these effects cause almost no change in the assessment of the incidence of taxes applying to the consumption of cigarettes. However, we find that a tax on the consumption of alcohol is slightly less regressive when measured with respect to lifetime income than when measured with respect to annual income.

Local House Price Indexes: 1982-91

Donald R. Haurin, Patric H. Hendershott, and Dongwook Kim

Working Paper No. 3933

December 1991

JEL Nos. R21, R31

Miscellaneous

We describe three house-price panel datasets for 1982-91. Next, we estimate a model that assumes the three sources are derived from an underlying unobserved price series, and we construct composite indexes that report house prices for 135 locations. These series can be used either as explanatory variables in studies of household formation, housing demand, and migration, or to test models of the determinants of spatial and intertemporal variations in house prices. Finally, we construct regional series (based, alternatively, on Census and Salomon Brothers' regions) and two national aggregates and describe their movements. We compare our series to other local, regional, and national series.

Anatomy of a Financial Crisis

Frederic S. Mishkin

Working Paper No. 3934

December 1991

JEL Nos. E0, E3, E5

Monetary Economics

This paper provides an asymmetric information framework for understanding the nature of financial crises.

A financial crisis is defined as a disruption to financial markets in which adverse selection and moral hazard problems become much worse, so that financial markets are unable to channel funds efficiently to those who have the most productive investment opportunities. As a result, a financial crisis can drive the economy away from an equilibrium with high output in which financial markets perform well to one in which output declines sharply.

The asymmetric information framework explains the patterns in the data and many features of these crises that are hard to explain otherwise. It indicates that financial crises have effects over and above those resulting from bank panics. Therefore, it provides a rationale for an expanded lender-of-last-resort role for the central bank in which the central bank uses the discount window to provide liquidity to sectors outside of the banking system.

Errors in Output Deflators Revisited: Unit Values and the PPI

Donald Siegel

Working Paper No. 3935

December 1991

Productivity

Extending a methodology developed by Lichtenberg and Griliches (1989), I examine the extent of measurement error in two independent indicators of price change: the producer price index (PPI), and the U.S. Census Bureau's unit value relative (UVR). Estimation of factor analytic models is improved by the availability of more accurate and comprehensive proxies for price and quality change within industries, and by a more comprehensive specification of the econometric model. I find that the UVR is a "noisier" measure of price change than the PPI is. The PPI adjusts for approximately 57 percent of change in product quality.

Openness and Inflation: Theory and Evidence

David H. Romer

Working Paper No. 3936

December 1991

JEL Nos. E31, E62, F41

Economic Fluctuations, Monetary Economics

This paper points out and tests a straightforward but previously unnoticed prediction of models in which the absence of precommitment in monetary policy leads to excessive inflation. Because unanticipated monetary expansion leads to real exchange rate depreciation, and because real depreciation is more harmful in more open economies, the benefits of surprise

expansion decrease with the degree of openness. Thus, under discretionary policymaking, money growth and inflation will be lower in more open economies. After presenting a simple theoretical model that demonstrates this prediction of the theory, I use cross-country data to examine the link between openness and inflation. The data reveal a strong negative link between openness and inflation.

Revisions of Investment Plans and the Stock Market Rate of Return

Mark Schankerman

Working Paper No. 3937

December 1991

JEL Nos. D92, E22

Asset Pricing

This paper explores the sources of uncertainty that cause firms to revise their capital investment plans, and cause the stock market to revise its valuation of those firms. I develop a simple method to decompose this uncertainty in micro, sectoral, and aggregate components, and to measure the degree of heterogeneity in micro responses to common disturbances. I apply the method to a panel dataset of U.S. firms from 1950-73. My empirical results show that the capital investment decision is governed primarily by idiosyncratic uncertainty, but that common disturbances are more important for movements in the stock market rate of return.

Individual Retirement Accounts: A Review of the Evidence

Jonathan S. Skinner

Working Paper No. 3938

December 1991

JEL Nos. E21, H20

Aging, Taxation

Recent legislative proposals have included restoring Individual Retirement Accounts (IRAs) to their pre-1987 eligibility rules. Whether IRAs are simply tax windfalls with no effect on saving, or whether they stimulate saving, is a crucial issue in evaluating the effectiveness of such proposals. In this paper, I review the previous literature on IRAs as well as present new evidence on the saving behavior of IRA contributors.

In brief, IRA contributors are wealthier and older than the general population. There is no clear consensus from structural economic models on whether IRA contributions are new saving or old, shuffled saving. Nevertheless, IRA contributors during the 1980s were remarkably active savers. For example, the typical IRA contributor was estimated to have increased total financial wealth in real terms by 71 percent in 1982-6. IRAs may have induced saving through psychological factors not normally present in orthodox economic models, but evidence on such factors is speculative rather than conclusive.

The Structure of Production, Technical Change, and Efficiency in a Multiproduct Industry:

An Application to U.S. Airlines

David H. Good, M. Ishaq Nadiri, and Robin C. Sickles

Working Paper No. 3939

December 1991

JEL Nos. D24, L93, C33

Productivity

We construct a short-run model of the firm describing the behavior of 13 U.S. airlines during the difficult transition to deregulation. We develop several scenarios to assess three common assumptions in cost studies: the use of time as a proxy for technological change, as opposed to a more thorough description of changes in the production technique; the assumption of cost-minimizing behavior, as opposed to permitting allocative inefficiency in input selection; and the assumption of exogeneity of output, capital, and their characteristics, as opposed to endogenous decisions regarding these variables.

We calculate derived properties of the resulting eight combinations of these issues to identify their sensitivity to the modeling assumptions. The most dramatic finding is that input concavity is reduced by 80 percent by relaxing the assumption of cost minimization. Demand and substitution elasticities are nearly twice as large under our most flexible, compared to the least flexible, scenarios. Measured returns to scale are substantively much higher when a more nearly complete description of the production technique is included in the model, and when this production technique is permitted to be modeled endogenously. Similarly, cost complementarity is quite sensitive to the assumption of endogeneity. Finally, cost models based on these three common assumptions overstate the level of productivity growth by as much as 40 percent. By correctly modeling and estimating the production technique, our most general model predicts a level of productivity growth that is quite similar to those based on calculations of Divisia indexes.

Why Didn't the Tax Reform Act of 1986 Raise Corporate Taxes?

James M. Poterba

Working Paper No. 3940

December 1991

JEL No. H25

Taxation

The Tax Reform Act of 1986 was projected to raise corporate taxes by more than \$120 billion from 1986-91. However, actual federal corporate tax receipts in the last five years have fallen far short of these projections. This paper explores the factors that have contributed to this shortfall.

The most important factor is lower-than-expected corporate profits, attributable to three principal factors. First, when the 1986 Tax Reform Act was enacted, the predicted rates of corporate profits were high by historical standards. In the late 1980s the U.S. economy did not experience total returns on corporate capital, the combined return to equity and debt investors, as high as the forecasts suggested.

Second, corporate interest payments were significantly higher, as a share of corporate operating income or GNP, in the late 1980s than in the years leading up to the Tax Reform Act. This reduced the corporate tax base and, in substantial part, ultimately may be attributable to the marginal incentive effects for debt and equity finance provided in the 1986 Tax Reform Act.

Third, also quite likely in reaction to recent tax changes, the last few years have seen rapid growth in the income reported by Subchapter S corporations. This income is taxed under the individual income tax. The rise of S corporations therefore has contributed to the erosion of the corporate income tax.

Fiscal Federalism in Europe: Lessons from the United States Experience

Robert P. Inman and Daniel L. Rubinfeld

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Taxation

The existing political and legal institutions of fiscal policymaking are under challenge. As the United States and the Eastern European and Soviet states experiment with policy decentralization, the states of Western Europe are looking to a more centralized policy structure via the European Economic Community. This paper seeks to raise issues of importance for all such reform efforts: notably the need to consider and balance the inefficiencies of fiscal policy decentralization (spillovers and wasteful fiscal competition) against the inefficiencies of fiscal policy centralization (policy cycles and localized "pork barrel" spending and taxes). We stress the need to develop new fiscal policy institutions emphasizing voluntary agreements and responsive "agenda-setters."

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