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Program Report

International Studies

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Since my last program report (*NBER Reporter*, Fall 1989), international economics has continued to focus on competitiveness and protection, macroeconomic policy coordination, international financial markets, and European economic and monetary integration in 1992. The interaction of growth and trade, and the credibility of policy reform also have grown as research topics, and reform in Eastern Europe has emerged as a major issue for researchers.

This report discusses the NBER program's research in six main areas: trade and growth; strategic behavior and trade; international macroeconomics; international finance; direct foreign investment; and policy uncertainty and reform in Eastern Europe. These are followed by a brief description of the coming reorganization of the program into two programs: International Trade and Investment (ITI), and International Finance and Macroeconomics (IFM). Finally, I discuss the NBER project on international taxation and the series of international seminars sponsored jointly by the NBER and other organizations.

Trade and Growth

Analyses of the interaction of trade and growth long have been a central part of the program's research. Growth theory and its applications, especially the relationship of external and scale economies to endogenous long-run growth rates, have experienced a revival in economic research recently. Several researchers in the program have emphasized the international aspects of endogenous growth. Others have focused on productivity growth and the interaction of income distribution and growth. Irving B. Kravis and Robert E.

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This issue of the *Reporter* highlights the Bureau's Program in International Studies. Next, Gene M. Grossman describes his research in innovation in the global economy. 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.

Lipsey have been important contributors to the development of comparative data in this area.¹

Two other leading researchers in this area are Gene M. Grossman and Elhanan Helpman. They find that openness to trade can influence the long-run growth rate by speeding technology transfer and by increasing the diversity of product availability. Faster technology transfer can increase or decrease growth, while increased product diversity generally increases growth.² See Grossman's research summary, "Innovation in the Global Economy," in this issue.

¹I. B. Kravis and R. E. Lipsey, "The International Comparison Program: Current Status and Problems," NBER Working Paper No. 3304, March 1990.

²G. M. Grossman and E. Helpman, "Quality Ladders and Product Cycles," NBER Working Paper No. 3201, December 1989, and *Innovation and Growth in the Global Economy*, Cambridge, MA: MIT Press, 1991.

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John F. Helliwell confirms the role of technology transfer.³ Stanley Fischer, returning from his term as vice president and chief economist at the World Bank, has surveyed the work on growth and development. He finds that openness, human capital, and market efficiency increase growth. In separate papers, he and James A. Brander report evidence of growth convergence, and Brander finds that reduction in population increase has a positive effect on growth.⁴

Willem H. Buiter and Kenneth M. Kletzer are working on the persistence of national and regional differentials in productivity growth, focusing on the role of fiscal policy.⁵ Richard K. Lyons is studying external economies and productivity growth in manufacturing. He and his collaborators show that, while in the short run, the links between an industry and its customers are relevant, in the long run the links to suppliers are what counts.⁶ This confirms the emphasis of Grossman and Helpman on the importance for growth of diversity of supply of intermediate goods through trade.

Using political economy models, both Torsten Persson and Guido Tabellini, and Dani Rodrik, find that inequality of income distribution decreases growth. In the Persson-Tabellini study, income inequality increases the resources devoted to struggle over income distribution, reducing resources available for growth.⁷ In the more traditional framework of an equilibrium trade model, Edward E. Leamer is studying the effects of a U.S.-Mexico free trade agreement on income distribution.

International economics has a long connection to regional and urban economics, going back at least to Bertil Ohlin's *International and Interregional Trade*. In this tradition, Paul R. Krugman has shown the conflicting effects of scale economies and wage differentials for location decisions of producers in the emerging European single market.⁸ Richard E. Baldwin shows

³A. Chung and J. F. Helliwell, "Macroeconomic Convergence: International Transmission of Growth and Technical Progress," NBER Working Paper No. 3264, February 1990.

⁴S. Fischer, "Growth, Macroeconomics, and Development," NBER Working Paper No. 3702, May 1991; and J. A. Brander, forthcoming NBER Working Paper.

⁵W. H. Buiter and K. M. Kletzer, "Persistent Differences in National Productivity Growth Rates with Common Technology and Free Capital Mobility: The Roles of Private Thrift, Public Debt, Capital Taxation, and Policy Toward Human Capital Formation," NBER Working Paper No. 3637, February 1991.

⁶E. J. Bartelsman, R. J. Caballero, and R. K. Lyons, "Short- and Long-Run Externalities," NBER Working Paper No. 3810, August 1991.

⁷T. Persson and G. Tabellini, "Is Inequality Harmful for Growth? Theory and Evidence," NBER Working Paper No. 3599, January 1991; and A. Alesina and D. Rodrik, "Distributive Politics and Economic Growth," NBER Working Paper No. 3668, March 1991.

⁸P. R. Krugman, "Increasing Returns and Economic Geography," NBER Working Paper No. 3275, March 1990.

that scale economies could permanently increase growth in the integrated European economy.⁹ In a study across U.S. cities, James E. Rauch reports that an increase in the average level of human capital, measured by years of education, raises average productivity growth.¹⁰ This confirms Fischer's results in his cross-country study.

Robert E. Baldwin continues to head the project on American trade relations, which has focused recently on the Uruguay Round of General Agreement on Tariffs and Trade (GATT) negotiations. This project brings together researchers and trade policy officials to discuss the effects of U.S. trade policy. Robert Baldwin and J. David Richardson have edited an NBER conference report on *The Uruguay Round and Beyond: Problems and Prospects*. See Bureau News in this issue. Anne O. Krueger also is working on the political economy of U.S. trade policy.¹¹

Strategic Behavior and Trade

The analysis of trade, and the consequences of trade policy in a world of imperfect competition and strategic behavior between and among governments and actors in the private sector, has been a major research area in the program since the early 1980s. Robert Baldwin and Richardson separately have provided overviews of this line of research and its implications for the analysis of policy.¹² Richardson notes the growth of "minilateralism" in trade negotiations: agreements across groups of countries or across sectors that violate the GATT's multilateral most favored nation principle. He argues that this may be mildly liberalizing for U.S. trade.

Carsten Kowalczyk and Jonathan Eaton have been working in Richardson's minilateral framework. Kowalczyk shows that in this situation a small country may not benefit from unilateral free trade, preferring to enter a minilateral agreement. Eaton explores the role of national economic power and, more explicitly, sanctions in this world. He is interested in the design of systems of rules that maintain international agreements in this environment.¹³

Several researchers have continued the program's tradition of analysis of trade policy with imperfect com-

petition. S. Lael Brainard shows that the last to exit in a shrinking international industry may benefit most. Robert C. Feenstra has studied the effects of trade policy on the distribution of the gains from trade with incomplete information. Kala Krishna recently has analyzed the pattern of rent sharing under the Multifiber Arrangement (MFA) that controls trade in textiles. She finds that importers benefit substantially from the MFA.¹⁴

Barbara J. Spencer has continued her work on vertical integration and trade, asking when it is advantageous for a domestic firm to form a joint venture with a foreign supplier of an input. Marie C. Thursby has continued her work on international patent races and the strategic use of product standards as trade policy. She notes that these types of policies may reduce consumer welfare by reducing product diversity.¹⁵

On the empirical side, Richard C. Marston has continued his comparative work on trade pricing behavior. He finds more extensive pricing to market by Japanese firms than by American firms, perhaps to maintain market share, in the face of exchange rate fluctuations.¹⁶ James A. Levinsohn asks whether trade liberalization provides market discipline in the form of lower domestic prices in Turkey, and finds that it does.¹⁷ Richard H. Clarida brings recent econometric developments involving cointegration tests to the interpretation of a traditional form of import demand equation for the United States, putting new theoretical life into a widely used structural equation that had been nearly discredited as being ad hoc.¹⁸

The program's work on strategic behavior and trade has helped to stimulate the movement in the economics profession toward analysis of imperfectly competitive environments. The papers by Robert Baldwin and Richardson, mentioned earlier, provide good summaries of the current state of this line of research.

⁹Richard E. Baldwin, "Measuring 1992's Medium-Term Dynamic Effects," NBER Working Paper No. 3166, November 1989.

¹⁰J. E. Rauch, forthcoming NBER Working Paper.

¹¹A. O. Krueger, "The Political Economy of American Protection in Theory and Practice," NBER Working Paper No. 3544, December 1990.

¹²J. D. Richardson, "U.S. Trade Policies in the 1980s: Turns—And Roads Not Taken," NBER Working Paper No. 3725, June 1991; and Robert E. Baldwin, forthcoming NBER Working Paper.

¹³C. Kowalczyk, "Welfare and Customs Unions," NBER Working Paper No. 3476, October 1990; and J. Eaton and M. Engers, "Sanctions," NBER Working Paper No. 3399, June 1990.

¹⁴S. L. Brainard, "Last One Out Wins: Trade Policy in an International Exit Game," NBER Working Paper No. 3553, December 1990; R. C. Feenstra, "Distributing the Gains from Trade with Incomplete Information," NBER Working Paper No. 3277, March 1990; and R. Erzan, K. Krishna, and L. H. Tan, "Rent Sharing in the Multifiber Arrangement: Theory and Evidence from U.S. Apparel Imports from Hong Kong," NBER Working Paper No. 3673, April 1991.

¹⁵B. J. Spencer and R. W. Jones, "Vertical Foreclosure and International Trade Policy," NBER Reprint No. 1579, August 1991; and M. C. Thursby, forthcoming NBER Working Paper.

¹⁶R. C. Marston, "Price Behavior in Japanese and U.S. Manufacturing," NBER Working Paper No. 3364, May 1990.

¹⁷J. A. Levinsohn, "Testing the Imports-as-Market-Discipline Hypothesis," NBER Working Paper No. 3657, March 1991.

¹⁸H. Clarida, "Cointegration, Aggregate Consumption, and the Demand for Imports: A Structural Econometric Investigation," NBER Working Paper No. 3812, August 1991.

Foreign Direct Investment

The growth of foreign direct investment (FDI) in the United States in the 1980s, the growth in transborder investment and merger and acquisition activity in the European Community (EC) as it moves to the single market in 1992, the growth of Japanese investment in Pacific Asia, and the prospect for investment in Eastern Europe together have stimulated a renewed interest in FDI among program members. Two recent studies provide partial overviews of the data and issues in this field. Michael R. Darby, on leave from the NBER as Under Secretary of Commerce, has supervised the first annual report by the Department of Commerce on *Foreign Direct Investment in the United States*, which presents and analyzes currently available data. Rachel McCulloch has continued her work in this area, focusing on inward investment in the United States and on multilateral negotiations on FDI.¹⁹

Several researchers have focused on the role and behavior of multinational corporations (MNCs). Lipsey has continued his research on U.S. firms' activities abroad and foreign firms' activities in the United States. He shows that in response to the 1992 single market program in the EC, U.S. manufacturing firms, already well-established in Europe, are expanding their activities in such areas as marketing and finance, rather than expanding plant.²⁰ Magnus Blomström's work has focused on the effects of MNC activities in host countries. A study of Mexico shows that U.S. investment acts as a catalyst for productivity growth there.²¹ James R. Markusen also has studied the U.S.-Mexico relationship, using a computable general equilibrium model to estimate the effects of a free trade agreement in the auto industry.²²

Other researchers have studied the determinants of FDI. Koichi Hamada has examined the pattern of FDI across the Pacific, and the trade-offs between trade and FDI.²³ Albert Ando and Jeffrey A. Frankel have continued their separate work on international differ-

ences in the cost of capital.²⁴ Eliana A. Cardoso has studied the determinants of the investment slump in Latin America and reports a significant role for the deterioration of the terms of trade, increased macroeconomic instability, and the size of the foreign debt.²⁵ Kenneth A. Froot has studied Japanese FDI and is organizing an NBER conference on FDI in May 1992.²⁶

International Macroeconomics

International macroeconomics has been a core area of the program since it began in 1978. I interpret that term as including the study of international and comparative macro relationships. Researchers in the program have studied the behavior of exchange rates in target zones, the determinants of real exchange rates, the development of EC macro institutions, and other topics.

The single most popular of these topics over the past two years has been the behavior of nominal exchange rates within target zones such as the European Monetary System (EMS). Krugman's seminal paper, discussed in my 1989 program report, showed that, because of a condition related to "smooth pasting" in finance, the existence of a target zone that is credibly defended at the margin by the monetary authorities would contribute to the stabilization of the exchange rate within the zone. Subsequently he demonstrated how the existence of limited reserves would modify the results, and Bernard Dumas has followed that line by showing the form of central bank agreements that could maintain a sustainable zone.²⁷

One implication of the earlier Krugman paper was that the distribution of observations of the exchange rate within the zone should be concentrated near the edges, a bimodal distribution. Several researchers, among them Robert P. Flood, show that in fact the distributions of exchange rates within the EMS are more similar to normal, with a peak near the center of the

¹⁹R. McCulloch, "Investment Policies in the GATT," NBER Working Paper No. 3672, April 1991.

²⁰R. E. Lipsey, "American Firms Face Europe: 1992," NBER Working Paper No. 3293, March 1990, and in U.S.-Japan Economic Forum, Volume 1, M. Feldstein and Y. Kosai, eds., Cambridge, MA: NBER, 1990.

²¹M. Blomström and E. N. Wolff, "Multinational Corporations and Productivity Convergence in Mexico," NBER Working Paper No. 3141, October 1991.

²²L. Hunter, J. L. Markusen, and T. Rutherford, "Trade Liberalization in a Multinational-Dominated Industry: A Theoretical and Applied General Equilibrium Analysis," NBER Working Paper No. 3679, April 1991.

²³K. Fukao and K. Hamada, "International Trade and Investment Under Different Rates of Time Preference," NBER Working Paper No. 3457, October 1990.

²⁴A. Ando and A. J. Auerbach, "The Cost of Capital in Japan: Evidence and Further Results," NBER Working Paper No. 3371, May 1990; and J. A. Frankel, "Japanese Finance: A Survey," NBER Working Paper No. 3156, November 1989.

²⁵E. A. Cardoso, "Capital Formation in Latin America," NBER Working Paper No. 3616, February 1991.

²⁶K. A. Froot, "Japanese Foreign Direct Investment," NBER Working Paper No. 3737, June 1991.

²⁷P. R. Krugman and J. J. Rotemberg, "Target Zones with Limited Reserves," NBER Working Paper No. 3418, August 1990; and F. Delgado and B. Dumas, "Monetary Contracting Between Central Banks and the Design of Sustainable Exchange Rate Zones," NBER Working Paper No. 3440, September 1990.

zone.²⁸ This observation led to a number of empirical papers providing alternative explanations of this fact. Karen K. Lewis reports that it could result from the market believing that the probability of central bank intervention increases as the rate moves away from the center of the zone. Lars E. O. Svensson demonstrates that it could be the result of possible realignment of the central rate. Dumas finds that it could result from movement of the "fundamentals" that is mean-reverting. Kathryn M. Dominguez notes that it could be caused by a credible policy of intervention within the zone.²⁹ This remains a popular area for research.

A related focal point of research is the determination of real exchange rates. Kenneth Rogoff has studied the effects of government spending on the real exchange rate. He and Froot find a positive relationship both in the Bretton Woods period and in the EMS.³⁰ Francesco Giavazzi and Alberto Giovannini are doing research that shows that endogenous differential investment and productivity growth move real exchange rates within the EMS. Separately, Robert E. Cumby, Charles M. Engel, and Frankel have demonstrated the tendency of real exchange rates to return to equilibrium values in the long run. Alan C. Stockman has shown how fluctuations in real exchange rates might be related to changes in tastes or technology.³¹

Several researchers have studied the formation of economic institutions, particularly in the context of European integration. Alessandra Casella has shown how common institutions may evolve in parallel with the unification of markets, via the provision of public goods, such as legal enforcement, that support the

²⁸R. P. Flood, D. J. Mathieson, and A. K. Rose, "An Empirical Exploration of Exchange Rate Target Zones," NBER Working Paper No. 3543, December 1990.

²⁹K. K. Lewis, "Occasional Interventions to Target Rates with a Foreign Exchange Application," NBER Working Paper No. 3398, June 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; F. Delgado and B. Dumas, "Target Zones Big and Small," NBER Working Paper No. 3601, January 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.

³⁰K. A. Froot and K. Rogoff, "The EMS, the EMU, and the Transition to a Common Currency," NBER Working Paper No. 3684, April 1991.

³¹R. E. Cumby and J. Huizinga, "The Predictability of Real Exchange Rate Changes in the Short and Long Run," NBER Working Paper No. 3468, October 1990; C. M. Engel and J. D. Hamilton, "Long Swings in the Exchange Rate: Are They in the Data and Do Markets Know It?" NBER Working Paper No. 3165, November 1989; and A. C. Stockman and L. L. Tezar, "Tastes and Technology in a Two-Country Model of the Business Cycle: Explaining International Comovements," NBER Working Paper No. 3566, December 1990.

markets.³² Barry J. Eichengreen has studied the possible need for fiscal unification in Europe.³³ Richard Portes has researched the international costs and benefits from European economic and monetary union in the context of a tripolar (United States, Europe, Japan) world.³⁴

Other lines of research in international macroeconomics do not fit into the three main areas just discussed. Frankel has continued his work on policy coordination under uncertainty about the current state or true structure of the economy.³⁵ Michael Bruno has resumed his work on macro stabilization problems, upon his return to the program after concluding his term as governor of the Bank of Israel.³⁶ With colleagues from the International Monetary Fund (IMF), I have been studying the role of commodity price indexes as predictors of general inflation, finding that they are useful in calling turning points in inflation.³⁷

International Finance

International finance has been an increasingly important research area in the program in the past two years. The work on exchange rate target zones, described earlier, could be considered part of international finance. Other topics include the characterization of behavior of foreign exchange markets, patterns of speculation in these markets, and pricing of developing country debt.

Robert J. Hodrick has continued his work on excess returns in foreign exchange markets and their relationship to excess returns in stock markets. Hodrick's research, as well as that of Frankel and Froot, calls into question the assumption of efficiency in the foreign

³²A. Cassella and J. S. Feinstein, "Public Goods in Trade: On the Formation of Markets and Political Jurisdictions," NBER Working Paper No. 3554, December 1990.

³³B. J. Eichengreen, "Is Europe an Optimum-Currency Area?" NBER Working Paper No. 3579, January 1991.

³⁴G. Alogoskoufis and R. Portes, "International Costs and Benefits from EMU," NBER Working Paper No. 3384, June 1990.

³⁵S. Erwin, J. A. Frankel, and K. E. Rockett, "A Note on Internationally Coordinated Policy Packages Intended to Be Robust Under Model Uncertainty," NBER Working Paper No. 3747, June 1991.

³⁶M. Bruno, "High Inflation and the Nominal Anchors of an Open Economy," NBER Working Paper No. 3518, November 1990.

³⁷J. M. Boughton, W. H. Branson, and A. Muttardy, "Commodity Prices and Inflation: Evidence from Seven Industrial Countries," NBER Working Paper No. 3158, November 1989.

exchange markets.³⁸ Dwight M. Jaffee and I have modeled the equilibrium interest differential across currencies with asymmetric information, and have suggested that, by improving information on European markets, the EC 1992 integration could reduce interest rates in Europe.³⁹

Nancy P. Marion has been studying the behavior of two-tier exchange markets in Europe and Latin America, finding that, at least in Europe, they provide little insulation of domestic interest rates from international influences.⁴⁰ Takatoshi Ito's work on daily volatility of exchange rates shows that periodic changes in volatility extend across markets; that is, an increase in volatility in New York is followed by an increase in Tokyo, and then in Europe.⁴¹ Vittorio U. Grilli and Giancarlo Corsetti report that the capital market integration can reduce exchange rate volatility.⁴²

Richard M. Levich and Carol L. Osler have studied patterns of speculative behavior in foreign exchange markets. Levich shows that surprisingly simple technical trading rules can be profitable, adding to the evidence on the lack of market efficiency. In a forthcoming pair of working papers, Osler demonstrates how risk-averse speculators distribute themselves across forecast horizons.⁴³ Raquel Fernandez and Sule Ozler have continued their work on the pricing of developing country debt, showing that concentration among creditors can increase the price on the secondary market.⁴⁴ Several program meetings on issues of international asset pricing were organized by Dumas and Lewis over the past two years, both during the academic year and in the annual Summer Institute.

³⁸G. Bekaert and R. J. Hodrick, "Characterizing Predictable Components in Excess Returns on Equity and Foreign Exchange Markets," NBER Working Paper No. 3790, July 1991; and J. A. Frankel and K. A. Froot, "Exchange Rate Forecasting Techniques, Survey Data, and Implications for the Foreign Exchange Market," NBER Working Paper No. 3470, October 1990.

³⁹W. H. Branson and D. M. Jaffee, "The Globalization of Information and Capital Mobility," NBER Working Paper No. 3496, October 1990.

⁴⁰N. P. Marion, "Empirical Evidence on European Dual Exchange Rates, and Its Relevance for Latin America," NBER Working Paper No. 3809, August 1991.

⁴¹R. F. Engle, T. Ito, and W.-L. Lin, "Where Does the Meteor Shower Come From? The Role of Stochastic Policy Coordination," NBER Working Paper No. 3504, October 1990.

⁴²G. Corsetti and V. U. Grilli, "Exchange Rate Volatility in Integrating Capital Markets," NBER Working Paper No. 3570, December 1990.

⁴³R. M. Levich and L. R. Thomas, "The Significance of Technical Trading-Rule Profits in the Foreign Exchange Market: A Bootstrap Approach," NBER Working Paper No. 3818, August 1991; and C. L. Osler, forthcoming NBER Working Papers.

⁴⁴R. Fernandez and S. Ozler, "Debt Concentration and Secondary Market Prices: A Theoretical and Empirical Analysis," NBER Working Paper No. 3654, March 1991.

Policy Uncertainty and Reform in Eastern Europe

The spread of policy reform in the 1980s in the developing countries, and since 1989 in Eastern Europe, has given rise to renewed research interest in the causes and effects of uncertainty about policy, at both the micro and macro levels. To some extent, this is an extension of the rules versus discretion discussion of the 1970s. Most of the work discussed here considers the future path of policy to be uncertain, as viewed from the private sector.

Several researchers have been analyzing destabilizing forms of policy uncertainty. Maurice Obstfeld shows that escape clauses from otherwise fixed exchange rates, keyed to extreme potential shocks, can lead to unfavorable equilibriums. Stephen J. Turnovsky reports the general effects of policy uncertainty on the path of the exchange rate. Joshua Aizenman demonstrates the potential depressing effects of uncertainty about trade liberalization, and Robert W. Staiger and Tabellini compare rules and discretion in trade policy.⁴⁵

The credibility of policy changes also has attracted attention. Allan Drazen and Grilli show how crisis can contribute to the credibility of subsequent policy reform, and Giovannini describes how to estimate the size of the reserve stock that will make a fixed exchange rate credible.⁴⁶

Policy reform in Eastern Europe provides a particular form of policy uncertainty in which the path to the creation of a private sector and a market economy itself is uncertain. Jacob A. Frenkel, while on leave as economic counsellor and vice president of the IMF, Fischer, while on leave as vice president and chief economist of the World Bank, and Jorge Braga de Macedo, on leave as director of national economies at the European Commission, all played key roles in the reports prepared by their respective institutions on the situation in Eastern Europe.⁴⁷

⁴⁵M. Obstfeld, "Destabilizing Effects of Exchange Rate Escape Clauses," NBER Working Paper No. 3603, January 1991; E. L. Grinols and S. J. Turnovsky, "Stochastic Equilibrium and Exchange Rate Determination in a Small Open Economy with Risk-Averse Optimizing Agents," NBER Working Paper No. 3651, March 1991; J. Aizenman, "Trade Reforms, Credibility, and Development," NBER Working Paper No. 3600, January 1991; and R. W. Staiger and G. Tabellini, "Rules versus Discretion in Trade Policy: An Empirical Analysis," NBER Working Paper No. 3382, June 1990.

⁴⁶A. Drazen and V. U. Grilli, "The Benefits of Crises for Economic Reforms," NBER Working Paper No. 3527, December 1990; and A. Giovannini, "Currency Substitution and the Fluctuations of Foreign Exchange Reserves with Credibly Fixed Exchange Rates," NBER Working Paper No. 3636, February 1991.

⁴⁷G. A. Calvo and J. A. Frenkel, "Obstacles to Transforming Centrally Planned Economies: The Role of Capital Markets," NBER Working Paper No. 3776, July 1991; S. Fischer, "Privatization in East European Transformation," NBER Working Paper No. 3703, May 1991; and G. B. de Macedo and R. Portes, eds., "The Path of Reform in Central and Eastern Europe," in *European Economy, Special Issue 2* (1991).

Rudiger Dornbusch has been working on policy uncertainty and reform in Latin America and in Eastern Europe. His research on the transition from stabilization to growth emphasizes the likely negative effects of uncertainty about the maintenance of stability on capital flight and investment; he also has studied the lessons from the post-World War II monetary reforms for Eastern Europe today.⁴⁸ Sebastian Edwards has researched the potential lessons from Latin American experience for Eastern Europe.⁴⁹ During an extended visit to the Soviet Union, Linda Goldberg studied the working of the internal foreign exchange market there.⁵⁰

During the 1991 Summer Institute, Aizenman and Feenstra each organized one-day meetings on aspects of policy uncertainty.

Other Projects

In addition to what already has been described, Frenkel and Assaf Razin have continued their work on the international aspects of taxation.⁵¹ Alberto Giovannini and R. Glenn Hubbard, and Joel B. Slemrod from the Bureau's Program in Taxation, have organized a joint project on international taxation, with a conference held in September.

Meanwhile, Frenkel has replaced Bruno as governor of the Bank of Israel. Frenkel's replacement at the IMF is Michael L. Mussa, who returned to the program in 1990 after a term as a member of the President's Council of Economic Advisers. Richard Baldwin returned to the program in 1991 after a term on the Council's staff, and was replaced there by Staiger.

During the coming year, the program will be subdivided into Programs on International Trade and Investment (ITI) and International Finance and Macro-

economics (IFM). Each of these subsequently will become an independent program. The purpose of this change is to reduce the size and to increase the coherence of both groups.

Each year since 1979, the international studies program has held an intensive series of workshops and seminars in Cambridge in the first three weeks of August as part of the NBER's Summer Institute. This will continue under the new structure. The Summer Institute provides an especially important opportunity for the international studies group to gather, because its members are quite dispersed geographically. Since 1989, Marston and Froot have organized the international finance and macroeconomics sessions of the Summer Institute. Richardson has continued to organize the trade sessions, joined in 1989 and 1990 by Staiger and in 1991 by Fernandez.

Several international seminars now meet regularly under the joint auspices of the NBER and cooperating foreign institutions. The InterAmerican Seminar on Economics (IASE) is jointly sponsored with the Pontificia Universidad Católica (PUC) do Rio de Janeiro and meets annually in Latin America. It is organized by Edwards, and Edmar L. Bacha of PUC. Its last meeting was in Chile in March 1991, and was summarized in the Spring 1991 *NBER Reporter*.

The International Seminar on International Trade (ISIT) is sponsored jointly with the Centre for Economic Policy Research (CEPR) in London, and meets biannually in the United States or Europe. It is organized by Robert Baldwin, and L. Alan Winters of CEPR. The last meeting was in Cambridge in August 1990, and was summarized in the Fall 1990 *NBER Reporter*.

The newest of the series of seminars is the East Asian Seminar on Economics (EASE), which meets annually in East Asia. It is organized by Krueger and Ito. Its most recent meeting was in Taipei, Taiwan in June 1991, on the theme of protectionism and the trade regime in Asia and the United States. It is summarized in this issue of the *NBER Reporter*.

The model for these seminars is the annual International Seminar on Macroeconomics (ISOM), sponsored jointly by the NBER, the European Economic Association, and La Maison des Sciences de l'Homme. The ISOM is organized by Robert J. Gordon, and Georges de Mènil of the Ecole des Hautes Etudes en Sciences Sociales in Paris, and meets each June in Europe. Its activities were summarized by Gordon in a program report in the Spring 1991 *NBER Reporter*, and its 14th annual meeting is reported in this issue.

In addition, the NBER sponsors a joint session at the Summer Institute with the Foundation for Advanced Information and Research (Japan), and a conference in Tokyo with the Japanese Ministry of Finance, on U.S./Japanese economic issues.

⁴⁸R. Dornbusch, "From Stabilization to Growth," *NBER Working Paper No. 3302, March 1990*; and R. Dornbusch and H. Wolf, "Monetary Overhang and Reforms in the 1940s," *NBER Working Paper No. 3456, October 1990*.

⁴⁹S. Edwards, "Stabilization and Liberalization Policies in Central and Eastern Europe: Lessons from Latin America," *NBER Working Paper No. 3816, August 1991*.

⁵⁰L. S. Goldberg, "Internal Currency Markets and Production in the Soviet Union," *NBER Working Paper No. 3614, February 1991*.

⁵¹J. A. Frenkel, A. Razin, and S. Symansky, "International VAT Harmonization: Economic Effects," *NBER Working Paper No. 3656, March 1991*; and A. Razin and E. Sadka, "Vanishing Tax on Capital Income in the Open Economy," *NBER Working Paper No. 3796, August 1991*.

Innovation in the Global Economy

Gene M. Grossman

Technological progress has accounted for much of the improvement in our standards of living. Countries that have grown rapidly tend to produce a wider range of products, or to manufacture existing goods more cheaply. Where technology has been stagnant, economic growth has waned, perhaps because capital accumulation has run into diminishing returns. Thus it is not surprising that innovation plays a central role in many theories of long-run growth.

Technology also features prominently in the study of international trade. The theory of comparative advantage predicts that countries will export the goods that they produce most efficiently, while importing the goods that they are unable to produce, or can produce only at great cost. Improvements in technology give rise to changes in international competitiveness and thus to shifts in the pattern of specialization and trade.

Until recently, most economists interested in long-run growth or international trade viewed technological progress as a force generated outside the economic system. Thus they studied the implications of changes in technology without attempting to understand its causes. But the rapid growth of business spending on industrial research has made it abundantly clear that firms view innovation as a controllable process; they invest in knowledge, just as in plant and equipment, when they see prospects for adequate future returns. When seen as the deliberate outgrowth of corporate investments, rather than as an accidental consequence of scientific discoveries, innovation can be studied using economic analysis.

Elhanan Helpman and I have tried to shed light on the determinants of national growth rates, and on the evolution of trade in a world economy in which firms in different countries compete continually to bring out new and improved products. Our findings suggest that the international economy affects the growth processes in individual countries in important ways.

Dynamic Comparative Advantage

What determines the long-run pattern of trade in a dynamic world economy in which prior investments in technical know-how have produced comparative advantage? That depends on the industrial research process.

Investments in R and D generate knowledge, which has unique features as an economic commodity. First, knowledge can be used by many parties simultaneously. Second, the creators or owners of knowledge may not be able to prevent others from making unauthorized use of their intellectual property. Thus research by one party often generates external benefits, or "spillovers," so that other researchers gain valuable information without having to compensate the investing individuals.

Technological spillovers from research can be national or international in scope. If they are national, then only other individuals residing in the same country will benefit from the nonappropriable component of the research. If they are international, then researchers worldwide will share in the spillover benefits. Of course, reality lies between these extremes, since ideas readily cross international borders; but barriers created by language and the costs of transcontinental travel cause (sometimes substantial) lags in the transmission of knowledge.

If technological spillovers usually cross international borders, then long-run trading patterns are determined by conventional forces, such as national factor endowments.¹ A country such as Japan, with an abundance of human capital and a paucity of natural resources, will find industrial research relatively profitable and will devote extensive resources to it. Over time, the country will win a disproportionate share of the global technology races and will acquire a comparative advantage in high technology goods. But a country such as Australia, rich in arable land, will concentrate more of its efforts in agriculture and related activities and will import most of the knowledge-intensive goods it consumes. Indeed, we find that Japan's emergence as a dominant force in high technology happened after a period when accumulation of human capital was very rapid and when industrial R and D grew dramatically as a share of value added in industry.²

If the spillovers from industrial research are limited in geographic reach, then new forces come into play in determining dynamic comparative advantage. A country that has a head start in high technology, for reasons of historical accident or otherwise, will benefit from an initially large base of knowledge in its research sector. Foreign researchers will find themselves at a disadvantage, not having access to the public knowledge available to researchers in the more experienced country. As

¹G. M. Grossman and E. Helpman, "Quality Ladders in the Theory of Growth," NBER Reprint No. 1567, August 1991, and *Innovation and Growth and the Global Economy*, Cambridge, MA: MIT Press, 1991, Chapter 7.

²G. M. Grossman, "Explaining Japan's Innovation and Trade: A Model of Quality Composition and Dynamic Comparative Advantage," Bank of Japan Monetary and Economic Studies 8 (September 1990), pp. 75-100.

a consequence, the country that has the initial advantage may have a competitive edge that allows it to widen its technological lead, until it eventually comes to dominate world markets in the high technology sector.³ In this way, history (and the effects of short-lived policies) can be self-perpetuating.

Trade and Growth

Does openness to international trade promote faster growth in the long run? Many economists believe that it does, although until now there has been little theoretical basis for their claims.⁴ We now know that a country that is integrated into the world economy may benefit from gaining access to information in the global knowledge stock. That is, if integration gives rise to automatic technological spillovers, then the opening of an economy will contribute to growth by increasing the productivity of its industrial research sector.⁵ Alternatively, international spillovers of knowledge may come about at least partly as the result of contacts between business associates in different countries. It stands to reason that commercial contacts will increase with the volume of international trade. If so, then trade serves as an engine of growth by promoting international transmission of technical information.⁶

International trade promotes increased efficiency in research by another means as well. When firms in different countries do not compete with one another in a global market, these firms have no incentive to distinguish their research projects. Thus noncompeting companies may find themselves duplicating one another's research efforts. Openness to international trade implies that innovators in different countries will compete in world product markets with the fruits of their inventive efforts, and so they will have greater incentives to pursue unique and differentiated research lines.⁷

³G. M. Grossman and E. Helpman, "Hysteresis in the Trade Pattern," NBER Working Paper No. 3256, December 1990, and *Innovation and Growth and the Global Economy*, Chapter 8.

⁴S. Edwards, "Trade Orientation, Distortions, and Growth in Developing Countries," NBER Working Paper No. 3716, May 1991; A. O. Krueger, "The Importance of Economic Policy in Development: Contrasts Between Korea and Turkey," NBER Working Paper No. 2195, March 1987; and A. O. Krueger and D. Orsmond, "Impact of Government on Growth and Trade," NBER Working Paper No. 3545, December 1990.

⁵L. Rivera-Batiz and P. M. Romer, "Economic Integration and Endogenous Growth," *Quarterly Journal of Economics* 106 (1991), pp. 531-556.

⁶G. M. Grossman and E. Helpman, "Trade, Knowledge Spillovers, and Growth," NBER Reprint No. 1566, August 1991.

⁷L. Rivera-Batiz and P. M. Romer, "Economic Integration and Endogenous Growth"; and G. M. Grossman and E. Helpman, *Innovation and Growth and the Global Economy*, Chapter 9.

International integration affects not only the productivity of research, but also the incentives of entrepreneurs in different countries to carry out this investment activity. For one thing, integration into the world economy enlarges the size of the market in which the innovators in a particular country operate. This has two implications. First, a particular firm will have a larger set of potential customers for its innovative products. This implication of a larger market increases the profitability of R and D.

Second, each producer has more rival firms with whom it must compete for sales. This implication of a larger market reduces the profitability of R and D. For some specifications of the R and D process, these two effects offset each other exactly when technological spillovers are global; thus integration into a larger market has no net impact on the growth rate on this account. But if technological spillovers are national, then the positive effect of a greater customer base dominates the negative effect of more competitors for firms operating in the larger country. The larger country grows faster with trade than without, while the expansion of market size has a detrimental impact on growth in the smaller country.⁸

Finally, in an economy with several manufacturing sectors, international trade affects aggregate national rates of growth by altering the intersectoral allocation of resources in each country. A country with an abundance of resources used intensively in the dynamic, innovative sectors of the economy will specialize more of its activity in these sectors with trade than without; thus trade will tend to accelerate its growth. On the other hand, a country with an abundance of resources that are appropriate for production in sectors with less innovation potential may see its rate of output growth decline as the result of international integration, although its consumers may still benefit from having the opportunity to import the innovative goods invented and produced abroad.

Policy and Growth

When innovation is influenced by the profitability of industrial research, economic policies will affect national growth rates. For example, subsidies to R and D typically increase the incentives for research and thus the national rate of productivity gain. In an open economy, the effects of national policies will be transmitted abroad. A subsidy to R and D in one country often re-

⁸R. C. Feenstra, "Trade and Uneven Growth," NBER Working Paper No. 3276, March 1990; and G. M. Grossman and E. Helpman, *Innovation and Growth and the Global Economy*, Chapter 9.

duces the return to innovative activities in trade partner countries, and so retards the rate of innovation there. World innovation and growth actually may be slowed by a subsidy to R and D in a country that has comparative disadvantage in performing this activity.⁹

Innovation rates also are affected by trade policies. A policy that protects local producers of high technology goods will increase the incentives for R and D directly by boosting the profits earned by a successful innovator. But there also will be an indirect effect on the incentive to innovate that results from any change in factor costs induced by the trade policy. Often this latter effect will serve to impede growth. Suppose, for example, that traditional and high technology goods both are produced with skilled and unskilled labor, but that the high tech industry makes more intensive use of skilled labor. Then protection of high tech producers will raise the wage of skilled laborers and thus increase the cost of research. In some cases, protection of local high tech firms can be detrimental for a country's long-term growth.¹⁰

In any event, policy options should not be judged solely on the basis of their impact on the national growth rate, for several reasons. First, when innovation requires resources and therefore does not come without cost, market-determined levels of R and D can be too great or too little. The technological spillovers that emanate from the industrial research lab suggest that private investors will have too little incentive to innovate. But each innovation typically destroys the profits of extant producers, and so private investors who look only at their own return may overestimate the aggregate benefit from any invention. In some cases, this can lead to aggregate growth in an economy that is faster than would be optimal.¹¹

Also, in an open economy, consumers residing in any country will benefit from the opportunity to import innovative goods from abroad. Thus there can be gains from trade even when that trade slows the rate of output growth, and policies that accelerate output growth need not improve national welfare.¹²

One interesting example is a subsidy to R and D in a country that is lagging in the global technology race. If technological spillovers are national, such a subsidy

can engineer a "catch-up" that allows the initially lagging country to become competitive in high technology. But often the resource cost of this will be so high that the country would be better off by continuing to import the high technology products from abroad.¹³

North-South Trade

Another interesting question concerns the relationship between the growth process of the industrialized "North" and that of the less-developed "South." Most new inventions are made in the North, while entrepreneurs in the South endeavor to imitate products introduced abroad. When successful, the southern imitators often are able to take advantage of cheap labor costs at home to become competitive in world markets. Thus many innovative goods go through a product life cycle, with initial production taking place in the North, and later production taking place predominantly in the South.

The innovation and imitation processes clearly are interrelated. Faster imitation in the South implies that a northern innovator will have a shorter period during which it can earn a monopoly return on its innovation. But faster imitation also means that each northern innovator will face less competition from compatriot firms during the time that it survives as the technological leader. Thus faster imitation typically means greater profits for a shorter time. As a consequence, increased imitative activities in the South may accelerate or decelerate innovation in the North.¹⁴

A similar feedback works in the opposite direction. An increased rate of innovation in the North will shorten the period during which an imitator of a product of a prior generation can expect to earn a return on his or her investment. But more rapid innovation can expand the range of targets open to southern imitators and can generate greater knowledge spillovers from North to South. It is not possible to resolve, in general, whether rates of industrial learning in the developed and developing countries will move together or in opposition. Nonetheless, much can be said about the factors that determine the relationship between the two growth processes.

⁹G. M. Grossman and E. Helpman, "Comparative Advantage and Long-Run Growth," NBER Reprint No. 1494, January 1991.

¹⁰G. M. Grossman and E. Helpman, Innovation and Growth and the Global Economy, Chapter 10.

¹¹G. M. Grossman and E. Helpman, "Quality Ladders in the Theory of Growth."

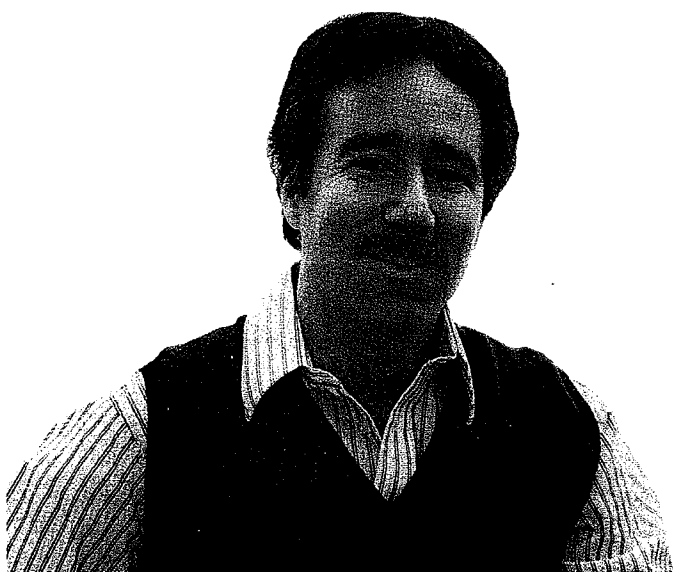
¹²G. M. Grossman and E. Helpman, "Growth and Welfare in the Small Open Economy," in E. Helpman and A. Razin, eds., International Trade and Trade Policy, Cambridge, MA: MIT Press, 1991.

¹³G. M. Grossman and E. Helpman, "Hysteresis in the Trade Pattern."

¹⁴G. M. Grossman and E. Helpman, "Endogenous Product Cycles," NBER Working Paper No. 2913, March 1989, and forthcoming in the Economic Journal; and "Quality Ladders and Product Cycles," Quarterly Journal of Economics 106 (1991), pp. 557-586.

Gene M. Grossman

Gene M. Grossman has been an NBER research associate since 1981. He received his B.A. in economics from Yale University in 1976, and his Ph.D. in economics from MIT in 1980.



Grossman became an assistant professor of economics and international affairs at Princeton University in 1980, was promoted to associate professor in 1985, and to full professor in 1988. He also has been a visiting scholar or fellow at: Tel Aviv University; University of Stockholm; Hebrew University; the School of Business Administration at the University of California, Berkeley; and the Bank of Japan.

Grossman has been a consultant to the OECD, World Bank, Federal Trade Commission, and other organizations and agencies. His articles have appeared in many academic journals, including the *American Economic Review*. In September his first book (coauthored by Elhanan Helpman), *Innovation and Growth in the Global Economy*, was published by the MIT Press.

Grossman's wife, Jean Baldwin Grossman, is an economist with Public/Private Ventures in Philadelphia. The Grossmans have two daughters: Shari, 5, and Dina, 3. His hobbies include skiing, playing tennis, and collecting antiques.

Fourth Franco-American Economic Seminar

The fourth Franco-American Economic Seminar, organized by NBER Research Associate Jacques Mairesse of the Institut National de la Statistique et des Etudes Economiques (INSEE), took place in Paris on June 13-14. The program, which focused on macroeconomic issues of Eastern European countries, was:

Kevin M. Murphy and Robert W. Vishny, NBER and University of Chicago, and Andrei Shleifer, NBER and Harvard University, "The Transition to a Market Economy: Pitfalls of Partial Reform," and Andrei Shleifer and Robert W. Vishny, "Pervasive Shortages Under Socialism" (NBER Working Paper No. 3791)

Discussant: Mathias Dewatripont, Université Libre de Bruxelles

Mathias Dewatripont, and Gerard Roland, Université Libre de Bruxelles, "The Virtues of Gradualism and Legitimacy in the Transition to a Market Economy"

Discussant: Olivier J. Blanchard, NBER and MIT

Olivier J. Blanchard, "The Speed of Transition in Eastern Europe"

Discussants: Daniel Cohen, Université de Nancy, and Charles Wyplosz, Delta Institute

Gerard Roland, and Thierry Verdier, Delta Institute, "Privatization in Eastern Europe: Irreversibility and Critical Mass Effects"

Discussant: Andrei Shleifer

Roger H. Gordon, NBER and University of Michigan, "Privatization: Notes on the Macroeconomic Consequences"

Discussants: Philippe Aghion, European Bank for Reconstruction and Development, and Jacques le Cacheux, Observatoire Français de Conjuncture Economiques (OFCE)

Roger H. Gordon and Michelle White, University of Michigan, "Intergovernmental Relations in the USSR"

Discussant: Thierry Verdier

Stanley Fischer, NBER and MIT, "Macroeconomic Problems of the Soviet Union"

Discussant: Jacques le Cacheux

Richard Portes, NBER and Birkbeck College, "The Transition to Convertibility for Eastern Europe and the USSR"

Discussant: Stanley Fischer

Daniel Cohen, "The Solvency of Eastern Europe"
Discussant: William H. Branson, NBER and Princeton
University

Charles Wyplosz, "On the Real Exchange Rate Effect of German Unification"
Discussant: Roger H. Gordon

Murphy, Vishny, and Shleifer show that a partial economic reform, such as those in the Soviet Union and China, can result in a substantial diversion of subsidized inputs away from state firms (which pay state prices), toward private firms (which pay free prices). The result of this diversion may be a reduction in total output.

Shleifer and Vishny then present a new theory of pervasive shortages under socialism. Because the planners—that is, bureaucrats in the ministries and managers of firms—cannot keep the official profits that firms earn, it is in their interest to create shortages of output and to collect bribes from the rationed consumers. Unlike official profits, bribes are not turned over to the state. Thus shortages enable the key decisionmakers who collect bribes to profit personally. According to this theory, an increase in the official price of a good actually might reduce output.

Dewatripont and Roland examine the impact of political constraints (such as unanimous or majority approval) on reform proposals when the work force is heterogeneous and has information about employment opportunities. The reform-minded government may want to move toward allocative efficiency, but the required shift to higher productivity would lead to massive layoffs and labor reallocation in the transition period. When it costs so much to lay workers off that partial reforms are preferable to full reforms, then gradualism becomes the optimal government course.

Blanchard observes that restructuring in Poland implies the eventual closing down of most state firms, labor shedding in the remaining firms, and the creation of a private sector. Since the beginning of the reform program, some have pushed for a faster adjustment, some for a slower one. Given the tools at the disposal of the government, Blanchard suggests that go-slow policies may impose lower social costs at this stage.

Roland and Verdier consider some of the policy problems related to the privatization of public assets in Central and Eastern Europe. They show that private investors, expecting the government to reverse part of the privatization program because of the transitional unemployment associated with enterprise restructuring, might coordinate on a suboptimal number of privatizations. The distribution of free shares to the population, currently advocated in Eastern Europe, may make the privatizations irreversible, though. This could occur without solving the coordination problem, and, in some cases, make people worse off.

Gordon examines alternative approaches to privatization in Eastern Europe. The resulting changes in firm behavior will depend on who ends up controlling the firm, the nature of their objectives, and the govern-

ment's degree of control. Even given firm behavior, the privatization process has important effects on the cash flow of both the government and households. Compensating changes will be required to restore budget balance in each case. Given the misallocation of resources in the past, the resulting reallocations can have important consequences for efficiency.

Gordon and White study local governments in the Soviet Union, assuming that economic reforms lead to partial decentralization of decisionmaking, allowing local governments to make most allocation decisions. The local governments have fairly efficient incentives in terms of locally controlled industries, but have an incentive to keep centrally controlled industries starved of resources. Decentralization also allows local governments to reduce tax payments to the central government, contributing to the current fiscal crisis in the Soviet Union.

The Soviet Union faces all the same macroeconomic reform issues as the other reforming socialist economies that start with a large budget deficit, high inflation and a monetary overhang, and a serious balance-of-payments problem. In addition, the Soviet Union must decide what the future relationships among its republics will be. Fischer discusses the macroeconomic policy issues within a framework that includes a single currency, substantial decentralization, but a central government that can conduct an independent fiscal policy. He also discusses the role for foreign aid.

Portes discusses when and how to introduce foreign exchange convertibility in the process of transformation of the socialist centrally planned economies into market economies. He elucidates the need for "robust sequencing" in a program of economic reforms, and the importance of establishing the credibility of the program. He treats macroeconomic stabilization as a central issue in the strategy for achieving convertibility.

Cohen examines endogenous growth possibilities in East European countries. He analyzes the solvency of Eastern Europe by calculating a "growth-adjusted-debt-per-effective-capita" measure of the burden of debt in these countries. Finally, he calculates a benchmark for the secondary market price of their debts.

The German economic and monetary unification may result in an appreciation of the Deutsche mark. However, Wyplosz shows that supply-side considerations imply a permanent fall in per capita wealth in Germany. There may be a long real depreciation, partly mirroring a worsened net asset position (as Germany borrows abroad to finance capital accumulation), and partly the result of increased output of German goods. While the short-run effect is ambiguous, a real depreciation is possible.

Also attending the conference were: François Bourguignon, Irena Grosfeld, Jean-François Nivet, and Claudia Senik Leygonie, Delta Institute; Sandrine Cazes and Lucrezia Reichlin, OFCE; Bernard Chavance, Ecole des Hautes Etudes en Sciences Sociales; Bronwyn H. Hall, NBER and University of California, Berkeley; Paul

Mazodier and Jacques Melitz, INSEE; Christophe Starzec, Centre d'Etude de Revenu et de Coûts; and Kunio Takayama, Japanese Ministry of Finance.

Renzo G. Avenasi, Università degli Studi di Trento; Giampiero Gallo, Università degli Studi di Firenze; and Peter H. Pauly, "Regional Saving-Investment Imbalances and the Real World Interest Rate"
Discussant: Xavier Sala-i-Martin, Yale University

International Seminar on Macroeconomics

The fourteenth annual International Seminar on Macroeconomics (ISOM) was held in Madrid on June 17-18. ISOM is cosponsored by the NBER, the European Economic Association, and La Maison des Sciences de l'Homme. This year's conference was hosted by the Centro de Estudios Monetarios and Financieros of the Banco de España. ISOM is jointly organized each year by Robert J. Gordon of the NBER and Northwestern University and Georges de Mènil of the Ecole des Hautes Etudes en Sciences Sociales (EHESS). The papers and their discussants were:

Stephen Nickell, Nuffield College, Oxford University;
Sushil Wadhvani, Goldman, Sachs & Company;
and Martin Wall, Coopers & Lybrand, "Productivity Growth in U.K. Companies, 1975-86"

Discussants: Heinz König, Universität Mannheim,
and Jacques Mairesse, NBER and Institut National de la Statistique et des Etudes Economiques

Christopher A. Sims, NBER and Yale University, "Issues in the Recent Development of Time-Series Econometrics"

Discussants: Martin S. Eichenbaum, NBER and Northwestern University, and Albert Marcet, Universidad Pompeu Fabra, Barcelona

Bennett T. McCallum, NBER and Carnegie-Mellon University, "A Reconsideration of Interest Parity"

Discussants: Francesco Giavazzi, NBER and University of Bologna, and Peter H. Pauly, University of Toronto

David Miles, Birkbeck College, "Financial Liberalization, the Housing Market, and the Current Account"

Discussants: Miguel Sebastian, Universidad Complutense, and Stephen P. Zeldes, NBER and University of Pennsylvania

Jean-Charles Rochet, Université des Sciences Sociales de Toulouse, "Capital Requirements and Bank Behavior"

Discussants: Colin Mayer, City University Business School (London), and Rafael Repullo, Banco de España

Samuel Bentolila, Banco de España, and Gilles Saint-Paul, Delta Institute, "Labor Market Policy Innovations in Spain and Europe"

Discussants: Michael Burda, European Institute of Business Administration, and Lawrence F. Katz, NBER and Harvard University

Nickell, Wadhvani, and Wall investigate the level and rate of growth of total factor productivity in a large group of U.K. manufacturing companies. The authors conclude that higher levels of debt are associated with increases in both the level and the growth rate of productivity. Increases in market share are associated with lower productivity, and productivity growth was higher in union firms from 1979-89, but may have been lower in those firms from 1975-8.

Sims notes that France, Germany, Japan, the United Kingdom, and the United States show strong similarities in their responses to innovations in monetary policy variables. Increased interest rates are followed by sustained decreases in output, and generally also by sustained decreases in M1. Prices rise, at least initially, when interest rates increase. Sims concludes that these facts are not easily interpreted within any of the main schools of macroeconomic thought.

McCallum studies the apparent inefficiency of the forward market for foreign exchange. This failure is very closely related to the violation of uncovered interest parity. He finds that the "policy-response hypothesis," that central banks manipulate interest rate differentials in order to avoid rapid changes in exchange rates and in the interest rate differentials themselves, can explain some of the results, but is not consistent with the time-series properties of the differentials.

Miles focuses on the changes in U.S. and U.K. financial markets that made household borrowing, when backed by housing collateral, easier in the 1980s. He also examines the possible effects of liberalization in other countries. He attempts to gauge the extent of binding credit restrictions in continental Europe and Japan, and the effects of possible convergence in national systems of housing finance.

In January 1993 a new solvency ratio will be imposed on European Economic Community banks. Rochet finds that banks with low levels of capital may exhibit risk-loving behavior. Imposing minimum capital requirements could prevent such behavior.

Bentolila and Saint-Paul examine flexible labor market contracts in Spain, where this type of contract was legalized in 1984 and has rapidly replaced rigid employment arrangements with higher firing costs. For a panel of large Spanish industrial firms in 1985-8, they show that a statistically insignificant drop in inertia and a strong increase in the cyclical elasticity of labor demand followed the introduction of flexible contracts.

Avenasi, Gallo, and Pauly examine the effects of bond-financed transfers into Eastern Europe on world real interest rates and levels of economic activity. They show that both real interest rate and net activity effects

on industrial countries are likely to be fairly small, although the latter are regionally diverse.

This report was prepared by Lee Branstetter of Harvard University.

Selected papers from ISOM 1991 will be published in the *European Economic Review* in spring 1992.

Second Annual East Asian Seminar on Economics

The second annual East Asian Seminar on Economics was held in Taipei, Taiwan on June 19–21. The conference was sponsored jointly by the NBER, the Korea Development Institute (KDI), and the Chung-Hua Institution for Economic Research (CHIER). It was organized by Anne O. Krueger, NBER and Duke University; Takatoshi Ito, NBER and Hitotsubashi University; Chi-ming Hou, CHIER; and Chang-Hyun Nam, KDI. The program was:

Richard Snape, Monash University, "Discrimination, Regionalism, and GATT"

Discussants: Koichi Hamada, NBER and Yale University, and Wontack Hong, Seoul National University

Anne O. Krueger, "American Bilateral Trading Arrangements and East Asian Interests"

Discussants: Robert E. Baldwin, NBER and University of Wisconsin, Madison, and Chi-ming Hou

Gary Saxonhouse, University of Michigan, "U.S.–Japanese Trade Issues"

Discussants: Takatoshi Ito, and Yun-Wing Sung, Chinese University of Hong Kong

Chong-Hyun Nam, "Protectionist U.S. Trade Policy and Korean Exports"

Discussants: Shujiro Urata, Waseda University, and Chia Siow Yue, National University of Singapore

Motoshige Itoh and Kaori Hatanaka, University of Tokyo, "Access to the Japanese Market by Asian Countries"

Discussants: Chong-Hyun Nam, and Tan Eu Chye, University of Malaysia

Kenneth Flamm, Brookings Institution, "Semiconductor Trade"

Discussants: Gary Saxonhouse and Yun-Wing Sung

Ya-hwei Yang, CHIER, "Government Policy and Strategic Industries: The Case of Taiwan"

Discussants: Jung-Ho Yoo, KDI, and Tan Eu Chye

Masayoshi Honma, Otaru University of Commerce, "Japan's Agricultural Policy and Protection Growth"

Discussant: Joachim Zietz, Middle Tennessee State University

Wontack Hong, "Export-Oriented Growth and Equity in Korea"

Discussants: Motoshige Itoh and Richard Snape

Joachim Zietz, and Alberto Valdes, World Bank, "The Growth of Agricultural Protection: Its Causes and Consequences for Developing Countries and the GATT"

Discussant: Masayoshi Honma

Tran Van Tho, Obirin University, "Foreign Direct Investment and Technology Transfer in the Asian Pacific Region: Implications from Recent Trends"

Discussants: Tain-jy Chen, CHIER, and Takatoshi Ito

Shujiro Urata, "Japanese Foreign Direct Investment and Its Impact on Foreign Trade in Asia"

Discussants: Tran Van Tho and Jung-Ho Yoo

Robert E. Baldwin, and Douglas Nelson, Syracuse University, "The Political Economy of U.S.–Taiwanese Trade and Other International Relations"

Discussants: Koichi Hamada and Richard Snape

Jung-Ho Yoo, "Political Economy of Protection Structure in Korea"

Discussants: Anne O. Krueger and Chia Siow Yue

Chi-ming Hou and Tain-jy Chen, "Political Economy of Tariff Policy in Taiwan"

Discussants: Kenneth Flamm and Ya-hwei Yang

Snape asserts that the case for multilateralism and for nondiscrimination in trade is as strong as ever. Preferential arrangements will improve the multilateral system most when they are open to both new and old participants. Modest but frequent sets of GATT negotiations on a limited range of issues could complement such "blockbuster" negotiations as the Uruguay Round, and could help to enforce day-to-day application of nondiscrimination, Snape concludes.

Krueger shows that, even on optimistic assumptions about the success of the U.S.–Mexican free trade agreement, the volume of potential trade diversion from East Asia over the next ten years or more appears very small. Indeed, since the Latin American countries intend to open up their economies, their integration into the world economy and their faster economic growth likely will expand trading opportunities for all countries, including those in East Asia.

Saxonhouse finds that over the past 150 years Japan's economic performance relative to other major economies seems unrelated to all but the most radical institutional changes in the organization of product and factor markets. Given the relationship among economic growth, factor markets, and trade structure, few of the currently contemplated changes in Japanese economic institutions are likely to have any impact on the future structure and operation of the Japanese economy.

Nam argues that recent U.S. trade policy is drifting toward protectionist bilateralism. South Korean exports to the United States were lower than they otherwise would have been during the 1980s following the

threat and initiation of U.S. trade actions against South Korea. Voluntary export restraints appear to have been the most important protectionist instrument against South Korean exports to the United States.

Itoh and Hatanaka study the relationship between Japan's domestic economic structure and its pattern of imports. They find that the distribution system is crucial for imports of final consumption goods, while for intermediate goods, the domestic production system and interfirm relationships are the key. Changes in the distribution system, caused by the rapid growth of direct marketing, urbanization, improved transportation, and recent deregulation, have allowed retailers to achieve better economies of scale. Production networks also are changing: retailers are integrating vertically into other Asian countries.

Since 1986, the U.S. Department of Commerce has administered a pricing floor for world trade in memory chips called Fair Market Values (FMVs). Flamm compares the competitive market-clearing price of chips with the floors associated with the U.S. FMV system and other proposed fair pricing rules. This comparison shows that, over the life cycle of a semiconductor, an FMV-like system constrains competitive behavior.

Yang evaluates the effects of Taiwan's preferential loan policy and its program for technology and management guidance, both introduced in 1982. Preferential loans offer interest rates up to 2 percent below prime, and government technology and management guidance is subsidized by 60 percent. Yang finds that preferential loans do not influence the interest burden, investment, or operational performance of targeted firms significantly. Similarly, guidance through the government or from other institutions does not seem to alter a firm's production performance.

Using data from 14 countries for 1955-87, Honma finds that the demand for agricultural protection is higher when there is a rapid change in comparative advantage away from agriculture. Protection also increases when agriculture's share in the male labor force is more than 4-7 percent, and when agriculture's share in GDP is more than 3-4 percent.

Hong analyzes changes in economic inequality in Korea over the past 30 years. He also examines the tax and public expenditure system, the political economy of distribution policies, and the implication of such an economic regime on South Korea's future growth prospects. He concludes that further development of the economy of South Korea depends on its ability to generate consensus on the equity problem, and especially to establish harmonious labor relations.

Zietz and Valdes predict whether developing countries on the verge of industrialization could follow the example of Korea and Taiwan and move rapidly toward agricultural protection. They conclude that the likely changes in both agricultural and trade policy in developing countries will lower world prices at a rate similar to what is associated with agricultural protection by OECD countries.

Since the mid-1980s, the volume and diversity of technology flows, including high technologies from Japan, managerial resources from Japanese small- and medium-sized firms (SMSFs), and labor-intensive technologies from Asian newly industrialized economies (NIEs), have increased substantially. In 1985, when the value of the yen began to increase sharply, there was a rapid increase in Japanese technology transfer via foreign direct investment to the Asian Pacific region. Tho concludes that the increased flow of technology must be accompanied by increasing absorptive capacity in order to increase industrialization in Asian developing countries, and the increasing role of SMSFs and Asian NIEs as suppliers of technologies will facilitate and promote further industrialization in the region.

Urata examines the trends in, and underlying causes of, Japanese foreign direct investment from 1951 to the present. He also considers the behavior of Asian affiliates of Japanese firms and their effect on foreign trade in the Asian region. He concludes that the opening up of Japanese intrafirm transactions to foreign firms would generate further economic expansion in Asia and elsewhere.

Baldwin and Nelson point out that a framework in which the executive branch of government takes the initiative in setting policy is useful in explaining the trade policies of the United States and Taiwan, especially toward each other, in the early post-World War II period. In recent years, however, pressures from various domestic groups have played the key role in shaping the trade policies of these countries.

Yoo presents three measures of nominal protection for 1978, 1982, and 1988, and estimates effective rates of protection (ERPs) for 1978 and 1982. ERPs increased from 1978 to 1982, except in the machinery industries. Nominal rates of protection were influenced heavily by the government's agenda in the late 1970s and early 1980s. In the late 1980s, the influence of voting groups and the private sector became more important. Yoo concludes that the structure of nominal protection reflects the political economy more than effective protection does.

Trade policy is especially important to Taiwan because of its high ratio of external trade to GNP—nearly 80 percent in 1989—and its high concentration of trade with the United States and Japan. Hou and Chen note that nominal tariff rates have been declining in Taiwan since the mid-1970s, dropping sharply beginning in 1985. Effective real tariff rates declined from 1978 to 1981, and have fluctuated since around 7.5 percent. Import controls have loosened during the past 35 years. Using data from 1981 and 1986, Hou and Chen find that the structure of protection closely reflects the state's pro-industry, pro-export development strategy. Raw materials, intermediate goods, and capital equipment have been consistently favored imports. The most powerful interest groups in the determination of tariff and nontariff barriers were the public enterprises.

Other conference participants were: Ching-huei Chang, Academia Sinica; Kuo-shu Liang, Bank of Communication, Taiwan; Bih-Jane Liu, National Taiwan University; and Sho-chieh Tsiang and Tzong-shian Yu, CHIER. Peter Dohman of Duke University assisted with the preparation of this article. An NBER conference volume, edited by Krueger and Ito, will be published by the University of Chicago Press late in 1992.

Historical Labor Statistics

On June 21–23, a conference on historical labor statistics, arranged by the NBER's Program on the Development of the American Economy, took place in Lawrence, Kansas. The program, organized by Susan Carter and Roger Ransom, University of California, Riverside; Richard Sutch, NBER and University of California, Berkeley; and Thomas Weiss, NBER and University of Kansas, was designed to shed light on the economic behavior of households in late 19th century America. The program was:

George Alter and Elyce Rotella, Indiana University, "Buying Homes with Borrowed Money"

Allen C. Goodman, Wayne State University, and Michael Haines, NBER and Colgate University, "Homeownership and Housing Demand in Late 19th Century America"

Claudia Goldin, NBER and Harvard University, and Robert A. Margo, NBER and Vanderbilt University, "Downtime: Voluntary and Involuntary Unemployment of the Past and Present"

Joshua Rosenbloom, University of Kansas, "Male Labor Supply in the Late 19th Century: Evidence from Kansas Workers in the 1880s"

Martha Olney, University of Massachusetts, Amherst, "Making Music, Stitching Seams: Determinants of Ownership of Musical Instruments and Sewing Machines, 1889 and 1890"

Christopher Hanes, University of Pennsylvania, "Migration and Earnings in the Late 19th Century"

Robert Whaples, University of Wisconsin, Milwaukee, "Marriage Premia in Historical Perspective"

Price Fishback and Shawn Kantor, University of Arizona, "The Good, the Bad, and the Paycheck: Compensating Differentials in Labor Markets, 1884–1903"

Jeremy Atack, NBER and University of Illinois, Urbana-Champaign, and Fred Bateman, Indiana

University, "Louis Brandeis, Work, and Fatigue at the Start of the Twentieth Century: Prelude to Oregon's Hours Limitation Law" (NBER Historical Working Paper No. 25)

Debbie Mullin, University of Virginia, "An Interpretation of the Pattern of Strikes in the Early Years of the American Federation of Labor"

Susan Carter, Roger Ransom, and Richard Sutch, "Doing the Wright Thing: Carroll Wright and the Labor Statistics Movement"

Alter and Rotella find that, during the late 19th century, families with children were more likely to buy homes and incur debts because they expected their children's earnings to increase the family's future income. Despite the formal contract conditions of the 1890s—contracts typically were for short terms and did not allow for amortization—there was considerable flexibility in the ways that families handled mortgage debt. Ordinary workers could use mortgage debt to smooth consumption, and could practice a kind of lumpy amortization nearly a half century before fully amortized mortgages were common in the United States.

Goodman and Haines use data from state labor surveys of Kansas, Maine, and Michigan to estimate housing demand. They find that permanent income influenced the decision of whether to rent or own, while current income influenced the amount of current expenditures on housing. Age also affected the decision to buy, but not the spending decision. Race and place of birth affected both decisions.

In the late 19th century, between 32 and 63 percent of workers surveyed had experienced involuntary unemployment in the previous year, according to Goldin and Margo. The chances of becoming unemployed in the late nineteenth century were higher than in the late 1970s, but so was the probability of reemployment. Thus, unemployment spells were only about half as long as they are today. In two of the reporting states, about 80 percent of workers who experienced unemployment eventually were recalled; this suggests that seasonality explained much of downtime in the past. Various individual characteristics associated with stability (such as marriage and homeownership) lowered the chances of becoming unemployed, but these personal characteristics mattered much less than the worker's industry or occupation. Workers also appear to have substituted involuntary downtime for sick days or other voluntary absences.

Rosenbloom uses data from a survey of Kansas workers to estimate labor supply in the 1880s. Labor supply estimates that assume unemployment is involuntary imply a substantial increase in the elasticity of hours worked with respect to wages over the last century, while estimates that workers chose not to work imply very little change in the elasticity.

Using a Michigan survey of furniture and stone workers, Olney learns that only about 8 percent of the workers owned musical instruments of any sort, but about

one-third owned sewing machines. She finds that ownership of both goods rose with income among furniture workers. Married and native born workers also were more likely to own these durable goods. On the other hand, current saving had little effect on ownership of either good. Finally, the presence of children in a household increased the probability of owning a sewing machine but not a keyboard instrument.

Hanes shows that the earnings of immigrants in the late 19th century grew slowly relative to those of native-born Americans, contrary to the patterns of the late 20th century. Discrimination does not appear to be the sole cause, since similar differences in earnings exist between native-born Americans born in-state and those who migrated to the state. Hanes's results cast doubt on the usual human capital explanations of earnings differentials for immigrants.

Today, married men earn more than otherwise seemingly comparable single men. Whaples shows that historically this marriage premium was much smaller and, in some cases, negative. It tended to be larger for older males; men in larger cities; skilled and white collar workers; nonunionized workers; and to be much larger for women than for men. The primary causes for the premium during the late 19th century were human capital investment among married men and the selectivity of more productive men into marriage. Married men were less mobile then than now. This may explain the small or negative values of the premium at the time.

Fishback and Kantor find many similarities between turn-of-the-century and current labor markets. Around 1900, earnings rose at a diminishing rate with increases in experience and schooling. Women received significantly lower wages than men did, and child-rearing responsibilities lowered their earnings even further. Some industries paid higher wages than others, even for workers with similar characteristics. Workers in unions received higher wages than nonunionized workers. Then as now, workers were compensated for some unpleasant or dangerous aspects of the workplace: for example, children in New Jersey were compensated for working at night, exposure to profanity, and for illness; workers (primarily males) in Kansas, California, and Maine, were paid more for accepting a higher risk of accidental injury; and some workers may have received compensation for greater risks of layoffs.

Atack and Bateman use data from an 1892 California survey to ask whether fatigue induced by long hours of work under a variety of adverse conditions harmed the health of workers and may have justified regulation of hours and conditions of the workplace as a public health measure. Since ill health is influenced by factors other than fatigue, they control for a variety of personal, home, and work-related attributes such as age, sex, and marital status. They find no significant relationship between health and occupations in which machines set the pace. There is clear evidence, though, of systematic relationships between long hours of work in occupations with excessive heat exposure and deteriorating health, and

between years of exposure to toxins or dust and a worsening of health. Exposure for short periods of time produced relatively minor changes in health, but prolonged daily exposure to these conditions, particularly to dust and toxins, produced rapidly deteriorating health.

Mullin studies labor strikes between 1881 and 1900, a period coinciding with the emergence of the American Federation of Labor as the prototype of the modern union. She hypothesizes that two types of unions, with very different strike plans, existed at this time. The strong unions probably had sizable strike funds or existed in industries in which members had expectations of long-term employment. Consequently, they were more likely to engage in high-risk/high-payoff strikes. Weak unions, in contrast, tended to engage in safe strikes to avoid an exodus of members during a long, unsuccessful strike.

Carter, Ransom, and Sutch examine the procedures and protocols followed by Carroll Wright and his colleagues and find that the data presented in their reports is, in fact, accurate. Moreover, the state labor bureaus apparently obtained representative samples.

Also attending the conference were: Keith Chauvin, John Clark, Stan Deviney, Betsy Kuznesof, Donald Lien, and Carl Strikwerda, University of Kansas; Gregory Clark, University of California, Davis; Henry Gemery, Colby College; Mary Gregson and Andrew Seltzer, University of Illinois, Urbana-Champaign; Joan Hannon, St. Mary's College; Mary Mackinnon, McGill University; Daniel M. Raff, NBER and Harvard University; Ken Snowden, University of North Carolina; Kenneth L. Sokoloff, NBER and University of California, Los Angeles; Eugene Sigel, University of Massachusetts, Amherst; Terry Von Ende, Texas Tech University; and Charles Wetherall, University of California, Riverside. This report was prepared with the assistance of Terry Von Ende.

Trade Liberalization and Adjustment Assistance

The NBER's Program in International Studies held a conference on "Trade Liberalization and Adjustment Assistance" in Cambridge on August 2. Research Associate Robert C. Feenstra, University of California, Davis, organized the program:

Robert C. Feenstra, and Tracy R. Lewis, University of California, Davis, "Trade Adjustment Assistance and Pareto Gains from Trade"

K. C. Fung, Stanford University, and Robert W. Staiiger, NBER and Stanford University, "A Theory of Trade Adjustment Assistance"

Avinash Dixit, Princeton University, "Risk-Sharing, Adjustment, and Trade"

Richard Brecher and Ehsan U. Choudhri, Carleton University, "Pareto Gains from Trade Reconsidered: Compensating for Jobs Lost"

James A. Brander and Barbara J. Spencer, NBER and University of British Columbia, "Trade Adjustment Assistance: Welfare and Incentive Effects of Payments to Displaced Workers" (NBER Working Paper No. 3071)

Feenstra and Lewis argue that commodity taxes alone may not lead to gains from trade if all factors of production are not perfectly mobile. However, if the government knows the distribution of adjustment costs across individuals, then a single trade adjustment assistance subsidy to individuals willing to move between industries, combined with commodity taxes, can lead to gains from trade.

Fung and Staiger consider the potential role for trade adjustment assistance when a country is attempting to maintain a cooperative tariff arrangement with its trading partner, but is faced with a periodic need to relocate resources from a declining, import-competing sector to an export sector. They find that by effectively serving as a bribe to the trading partner, trade adjustment assistance enhances the degree of tariff cooperation sustainable between countries.

Dixit considers a small open economy with stochastic terms of trade. Labor movement is costly. One sector has constant returns to labor; the other has diminishing returns. Without markets for risk sharing, the sector with diminishing returns expands more slowly than is optimal in its early phase, but faster in the later phases. Contraction is generally too fast in all phases.

With efficiency-wage unemployment, gains from tariff reductions may not be feasible, Brecher and Choudhri find. When workers are compensated for jobs lost after liberalization of trade, then gains from liberalization are not feasible under certain plausible conditions.

Brander and Spencer analyze the welfare effects of conditional trade adjustment assistance (that is, assistance received only if displaced workers remain unemployed). They show that either conditional or unconditional assistance may impose efficiency costs. If the distribution of wage offers is uniform, though, the unconditional program is superior.

Also attending the conference were: Robert E. Baldwin, NBER and University of Wisconsin, Madison; William H. Branson, NBER and Princeton University; Alan Deardorff, University of Michigan; Jonathan Eaton and Raquel Fernandez, NBER and Boston University; Bakhtior Islamov, Uzbek Academy of Sciences; Michael Knetter, Dartmouth College; Kala Krishna and Dani Rodrik, NBER and Harvard University; James R. Markusen, NBER and University of Colorado; Wolfgang Mayer, Pennsylvania State University; Sweder J. G. van Wijnbergen, World Bank; and John D. Wilson, Indiana University.

Joint NBER Conference on Competitiveness

A conference on "The Competitiveness of U.S. Industries and Its Implications for the Future Relationship of the United States and Japan," jointly sponsored by the NBER, the Ministry of Finance (MOF), Japan, and the Foundation for Advanced Information and Research, Japan, took place in Tokyo on September 10-11. The program, organized by Hiroki Iwakura, MOF, was:

Andrew B. Lyon, NBER and University of Maryland, "Taxation, the Cost of Capital, and International Competitiveness: Insights from the U.S. Alternative Minimum Tax"

Shumpei Takemori, Keio University, "International Competitiveness and National Welfare"

George J. Borjas, NBER and University of California, San Diego, "Industrial Competitiveness and Human Resources"

Haruo Shimada, Keio University, "Japan's Direct Investment in the United States and Humanware Technology: With Special Reference to the Automobile Industry"

Robert E. Lipsey, NBER and City University of New York, "The Competitiveness of the United States and of U.S. Firms"

Haruki Yoshida, Mako Research Institute, "Liberalism Is the Best Industrial Policy"

Although international competitiveness is ill-defined, policymakers frequently wish to increase a nation's trade balance or level of investment. Tax policies could be used to pursue one or the other of these alternative goals, but simultaneously achieving both goals can be difficult, Lyon shows. He further demonstrates the difficulty in making international comparisons of the cost of capital by showing how, even within the U.S. tax system, investors are subject to a variety of investment incentives.

Takemori argues that productivity is the key factor behind the concept of competitiveness. His data suggest that Japanese productivity is increasing in those industries in which the United States used to dominate.

Borjas notes that it is difficult to construct measures of the skill level of workers. For example, although educational attainment has increased greatly since World War II, there have been changes in the quality of education at each grade level over that period. Nor does the skill level of a nation's work force readily translate into a measure of international competitiveness: the skill level of a work force must match employers' needs.

Shimada describes the dependence on human resources in Japanese production systems. He refers to the human assets of the production process as "humanware." Japanese firms export technology to their manufacturing operations in the United States, for ex-

ample to the General Motors-Toyota project in Fremont, California. But while Japanese techniques have worked well at the production level, there has been greater dissatisfaction at the managerial level. Shimada believes that Japanese firms must be more sensitive in their foreign operations to cultural differences outside of Japan.

Lipsev addresses the question of how to measure competitiveness, and of whether the United States has "lost" competitiveness. Among the measures he suggests are: shares in trade exports; relative prices; and output per capita. He concludes that the evidence regarding a fall in U.S. competitiveness is ambiguous at best. The data seem to suggest that both the United States and Japan have a comparative advantage in high tech products.

Yoshida addresses the relationship between competitiveness and industrial policy. He argues that the most efficient industrial policy is one of "liberalism": the government sets goals and lets the free market work.

November 1, 1991

Program Meeting: Financial Markets and Monetary Economics, NBER

November 6-8, 1991

The Impact of Eastern Europe on the International Trading System, Centre for Economic Policy Research

November 7, 1991

U.S. Waste Management Policies: Impact on Economic Growth and Investment Strategies, American Council for Capital Formation*

November 7-8, 1991

Program Meeting: Taxation, NBER

November 8, 1991

Program Meeting: Asset Pricing, NBER

November 15, 1991

Political Economy, NBER

November 15, 1991

Symposium on Stolper and Samuelson, "Protection and Real Wages": A Golden Jubilee, University of Michigan

November 19, 1991

Tax Policy and the Economy, NBER

November 22, 1991

Program Meeting: Labor Studies, NBER

November 22-23, 1991

Public Policy Conference, Carnegie-Mellon University—University of Rochester

November 24-26, 1991

Annual Meeting, Southern Economic Association*

November 28-29, 1991

Fourth Australasian Finance and Banking Conference, University of New South Wales*

December 5-6, 1991

Program Meeting: Industrial Organization, NBER

December 13-14, 1991

Universities Research Conference: Economics of the Environment, NBER

December 13-15, 1991

Finance and Development in Europe, Centre for Economic Policy Research

December 16-17, 1991

Private Sector Training, NBER

January 3-5, 1992

Annual Meeting, American Economic Association*

January 9-10, 1992

New Growth and Development Economics, NBER (with Tokyo Center for Economic Research and Centre for Economic Policy Research)

January 16-18, 1992

The Transition to Economic and Monetary Union in Europe, Bank of Portugal (with Centre for European Policy Studies)

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

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 Winter 1991/2 issue of the *Reporter* is December 1. If you have any questions about procedures for submitting materials for the calendar, please call Kirsten Foss Davis at (617) 868-3900.

January 22-24, 1992

Demographics of the Family, NBER (with Japan Center for Economic Research)

January 23-24, 1992

Social Protection versus Economic Flexibility: Is There a Trade-Off? NBER

February 7, 1992

Economic Fluctuations Research Meeting, NBER

February 7-8, 1992

Export Market Access, NBER

February 12-15, 1992

U.S.-Japan Economic Forum, NBER

February 26-29, 1992

Industrial Restructuring in Eastern Europe, NBER

February 28, 1992

Program Meeting: Financial Markets and Monetary Economics, NBER

March 6-7, 1992

Seventh Annual Conference on Macroeconomics, 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

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 8-10, 1992

Fifth InterAmerican Seminar on Economics, NBER

May 15, 1992

Foreign Direct Investment, NBER

June 11-13, 1992

Transatlantic Public Economics Symposium, NBER

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

November 12-13, 1992

Program Meeting: Taxation, NBER

November 22-24, 1992

Annual Meeting, Southern Economic Association*

September 19-23, 1993

Annual Meeting, National Association of Business Economists*

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

Bureau News

1991 Summer Institute

Over 700 economists from 180 universities and organizations around the world attended the NBER's 13th annual Summer Institute. This year's program was funded primarily by a grant from the Lynde and Harry Bradley Foundation, with additional support from the National Science Foundation and the Foundation for Advanced Information and Research (Japan).

There were 320 papers presented at 36 different sessions covering a wide variety of topics. A catalogue of all papers and work in progress can be obtained by writing to: Summer Institute Catalogue, NBER, 1050 Massachusetts Avenue, Cambridge, MA 02138.

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

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Robert E. Cumby	Sanford J. Grossman	Nancy Peregrin Marion	Garth Saloner	Tadashi Yamada
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Jorge Braga de Macedo	Michael R. Haines	Richard C. Marston	Ryuzo Sato	Victor Zarnowitz
Peter Diamond	Robert E. Hall	Bennett T. McCallum	Mark Schankerman	Richard J. Zeckhauser
William T. Dickens	Koichi Hamada	Rachel McCulloch	Myron S. Scholes	Stephen P. Zeldes
W. Erwin Diewert	Daniel S. Hamermesh	Robert L. McDonald	Anna J. Schwartz	

1991-2 Olin Fellows

The four NBER Olin Fellows for 1991-2 are: Steven T. Berry, Ricardo J. Caballero, J. Bradford De Long, and Kathryn M. E. Dominguez. The Fellows program is supported by a grant from the John M. Olin Foundation.

Berry plans to study the effect of environmental taxes on automotive pricing. He also will analyze the success of Japanese firms in television manufacturing: is it the result of superior products or more efficient production? Finally, Berry hopes to investigate ways to correct price indexes for quality change.

Berry received his Ph.D. from the University of Wis-

consin, Madison, in 1989, and became an NBER faculty research fellow that year. He also is an assistant professor of economics at Yale University.

Caballero will analyze the short-run dynamics of nonresidential investment and consumer durable purchases. He also will examine cyclical changes in productivity. In particular, he plans to use four-digit manufacturing data to estimate the role of interactions across sectors in cyclical variations in productivity.

Caballero received his Ph.D. from MIT in 1988, and was named an NBER faculty research fellow in 1991. He is on leave from Columbia University, where he is an associate professor of economics.

De Long will focus on how asset and capital goods markets shape and inform us about long-run growth: He will look at: comparative growth within the OECD over the last century; the relationship between stock prices, or equipment investment, and growth; and, the links between financial structure and growth in the United States and Great Britain at the turn of the 20th century.

De Long received his Ph.D. from Harvard University in 1987, the same year he became an NBER faculty research fellow. He has taught at MIT and Boston University and is now an assistant professor of economics at Harvard.

Dominguez will examine how central banks influence their credibility in the foreign exchange market. She also will study the International Monetary Fund as a coordinating institution for the Bretton Woods countries.

Dominguez, also an NBER faculty research fellow, received her Ph.D. from Yale University in 1987. She has worked for the Congressional Budget Office and the Federal Reserve Board of Governors, and has taught at Princeton University and Harvard's Kennedy School of Government, where she is an assistant professor of public policy.

New Conference Report Available

The Uruguay Round and Beyond: Problems and Prospects, an NBER Conference Report edited by Robert E. Baldwin and J. David Richardson, has just been published by the NBER.

This paperback volume is based on the papers presented at an NBER conference held in Washington in October 1990. The original papers were revised to reflect the resumption of negotiations in the spring of 1991.

Both Baldwin and Richardson are NBER research associates. The conference was part of the NBER's Trade Relations project, which they direct, and of the NBER's Program in International Studies.

The report may be obtained free of charge by writing to *Uruguay Round*, NBER Public Information Department, 1050 Massachusetts Avenue, Cambridge, MA 02138.

The Labor Market in International Perspective: A Call for Papers

On April 10 and 11, 1992, the National Bureau of Economic Research will hold a conference in Cambridge on "The Labor Market in International Perspective," organized by Francine D. Blau of the University of Illinois at Urbana-Champaign and Charles C. Brown of the University of Michigan.

The program will consist of seven papers with two formal discussants for each paper. There will be no published proceedings, but the conference will be summarized in the *NBER Reporter*.

The program will emphasize research aimed at better understanding of the operation and functioning of the labor market through international comparisons as well as case studies of other industrialized countries. A broad range of topics is appropriate. Examples include, but are not limited to: the impact of wage-setting institutions, such as economywide bargaining, pay courts, or contract extensions; labor market effects of formal schooling, apprenticeship, and on-the-job training; different approaches to the recruitment and selection of workers; effects of "egalitarian" versus "meritocratic" wage structures; the causes and consequences of shifting economic roles of women; labor market effects of an aging population; impacts of retirement benefits, welfare, unemployment insurance, mandated fringe benefits, minimum wage, antidiscrimination laws, health and safety regulation of the workplace, and other labor market regulations; analyses of trends in union membership and the impact of unions and other workers' organizations on wages and employment; analyses of the effects of regulatory reform; the impact of trade and immigration on domestic labor markets; and income and wage inequality.

In keeping with the NBER tradition, priority will be given to empirically oriented research. However, theoretical papers on topics related to the conference theme also are welcome.

Papers will be selected on the basis of an abstract of 500 to 1000 words or, when possible, a completed draft of the paper. Preference will be given to papers by younger scholars. Those who submit only abstracts are welcome to include a sample of their scholarly work such as a recent paper on another topic. Any research not published at the time of the conference may be submitted.

The deadline for submission of abstracts and papers is December 10, 1991. Authors chosen to present papers will be notified by January 15,

1992. The papers will be due at the NBER by March 18, 1992. The NBER will pay expenses of those chosen to give papers at the conference.

Abstracts and papers should be sent to: Professor Francine D. Blau, or Professor Charles C. Brown, National Bureau of Economic Research, 1050 Massachusetts Avenue, Cambridge, MA 02138.

Economic Fluctuations Group Meets

Over 120 members and guests of the NBER's Program in Economic Fluctuations attended a research meeting in Cambridge on July 12. NBER researchers John H. Cochrane, University of Chicago, and Valerie A. Ramey, University of California, San Diego, organized the following program:

Robert G. King, University of Rochester, "Money and Business Cycles"

Discussant: Timothy Fuerst, Northwestern University
Lawrence J. Christiano, Federal Reserve Bank of Minneapolis, and Martin S. Eichenbaum, NBER and Northwestern University, "Liquidity Effects, Monetary Policy, and the Business Cycle"

Discussant: Julio J. Rotemberg, NBER and MIT
Orazio P. Attanasio, Stanford University, "A Cohort Analysis of Saving Behavior by U.S. Households"

Discussant: Laurence J. Kotlikoff, NBER and Boston University
Harold L. Cole, Federal Reserve Bank of Minneapolis, and George J. Mailath and Andrew Postlewaite, University of Pennsylvania, "Social Norms, Savings Behavior, and Growth"

Discussant: Michael Woodford, NBER and University of Chicago

Thomas F. Cooley and Masao Ogaki, University of Rochester, "A Time-Series Analysis of Real Wages, Consumption, and Asset Returns under Optimal Labor Contracting: A Cointegration-Euler Equation Approach"

Discussant: John Y. Campbell, NBER and Princeton University

Francis X. Diebold, University of Pennsylvania, and Glenn D. Rudebusch, Federal Reserve Board, "Have Postwar Economic Fluctuations Been Stabilized?"

Discussant: Mark W. Watson, NBER and Northwestern University

King finds that a disturbance to the M1 money stock explains roughly one-quarter of the cyclical component of U.S. national product. Output peaks about six quarters after a positive monetary shock, and the real

effects of the shock dissipate totally after four years. Similar patterns are present in consumption and investment, although consumption changes less than output does, while investment changes more.

Christiano and Eichenbaum interpret the observed negative correlation between the nominal federal funds rate and the growth rate of money and real GNP as reflecting the liquidity effects of unanticipated shocks to monetary policy. Their model emphasizes the disruptive effects of changes in monetary policy on the production process.

Attanasio hypothesizes that the decline in *personal* saving rates in the 1980s may be attributable to the number of people in their forties and fifties at that time. After looking at other possibilities, he concludes that the only explanation for decreased saving is the increase in expenditure on durables. This might be caused by the decline in the relative price of durables, or by the introduction of a wide variety of new durable goods.

Cole, Mailath, and Postlewaite argue that differences in growth rates across countries can be explained without recourse to differences in underlying preferences, technologies, or endowments. Different social organizations lead to different patterns of behavior, which lead to different growth rates.

Cooley and Ogaki show that the time-series properties of aggregate consumption, real wages, and asset returns can be explained by a neoclassical model. Previous empirical rejections of the neoclassical model have suggested that the optimal labor contract model might be more appropriate. Cooley and Ogaki demonstrate that an optimal contract model restricts the long-run relationship between the real wage rate and consumption.

Diebold and Rudebusch examine the question of whether the U.S. economy became less volatile after World War II. They focus on the duration of business cycles, rather than their amplitude; in the process, they avoid the debate about the quality of prewar aggregate data. They find a shift toward longer expansions and shorter contractions after World War II, but no shift in the durations of whole cycles.

Financial Markets and Monetary Economics

Over 60 members and guests of the NBER's Program in Financial Markets and Monetary Economics met in Cambridge on July 18-19. Their agenda, organized by Program Director Benjamin M. Friedman, Harvard University, was:

Frederic S. Mishkin, NBER and Columbia University, "Is the Fisher Effect for Real? A Reexamination of the Relationship between Inflation and Interest Rates" (NBER Working Paper No. 3632)

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

Martin D. Evans, University of Michigan, and Karen K. Lewis, NBER and University of Pennsylvania, "Do Expected Shifts in Inflation Policy Affect Real Rates?"

Discussant: N. Gregory Mankiw, NBER and Harvard University

Jeffrey A. Frankel, NBER and University of California, Berkeley, and Cara Lown, Federal Reserve Bank of New York, "An Indicator of Future Inflation Extracted from the Steepness of the Interest Rate Yield Curve Along Its Entire Length"

Discussant: Angelo Melino, NBER and University of Toronto

Robert F. Engle III, NBER and University of California, San Diego; Takatoshi Ito, NBER and University of Minnesota; and Wen-Ling Lin, University of Wisconsin, Madison, "International Transmission of Stock Returns and Volatility—An Empirical Reappraisal"

Discussant: Daniel Nelson, NBER and University of Chicago

Jerry A. Hausman and Andrew W. Lo, NBER and MIT, and A. Craig MacKinlay, NBER and University of Pennsylvania, "An Ordered Probit Analysis of Transaction Stock Prices"

Discussant: Robert C. Merton, NBER and Harvard University

Bruce N. Lehmann, NBER and Columbia University, "Earnings, Dividend Policy, and Present-Value Relations: Building Blocks of Dividend Policy Invariant Cashflows"

Discussant: Robert J. Shiller, NBER and Yale University

From the end of World War II until October 1979, increases in inflation in the United States were highly correlated with increases in short-term interest rates. Since 1979, however, the relationship between interest rates and inflation has been much weaker. Mishkin notes that the relationship was also weak prior to World War II, and in other countries even in the postwar period. He concludes that there is no short-run relationship between interest rates and future inflation. There is, however, a long-run relationship in which inflation and interest rates share a common trend.

Evans and Lewis ask whether economic agents incorporate anticipated shifts in inflation policy into nominal interest rates. If so, then a shift to lower inflation will lead to systematically high ex post real rates. Using data from the postwar era, they find that real rates and expected inflation are not correlated.

Frankel and Lown address the problem of predicting the inflation spread. They allow the real interest rate to vary in the short run but to converge to a constant in the long run. The appropriate indicator of expected inflation can make use of the entire length of the yield curve, rather than being restricted to a spread between

two points. The resulting indicator does a relatively good job of predicting the inflation rate from 1960–88.

Engle, Ito, and Lin analyze correlations in stock returns and volatility between the Tokyo and New York markets. Domestic investors extract global information from the observed changes in foreign prices. This leads to correlations in international stock prices and volatilities.

Hausman, Lo, and MacKinlay estimate the conditional distribution of trade-to-trade price changes. They take into account the fact that transaction price changes occur in discrete increments, typically eighths of a dollar, and occur at irregular time intervals.

Lehmann searches for cash flows with two characteristics: asset prices can be calculated from their present values, and they are invariant with respect to dividend policy. He identifies residual income measures with these features under two assumptions: dividend policy does not alter risk premiums, and income earned from investments associated with dividend policy includes capital gains and losses.

Reprints Available

The following NBER Reprints, intended for nonprofit education and research purposes, are now available. (Previous issues of the *NBER Reporter* list titles 1–1562 and contain abstracts of the Working Papers cited below.)

These reprints are free of charge to corporate associates. **For all others there is a charge of \$3.00 (\$4.00 outside of the U.S.) per reprint requested. Advance payment is required on all orders. Please do not send cash.** Reprints must be requested by number, in writing, from: Reprint Series, National Bureau of Economic Research, 1050 Massachusetts Avenue, Cambridge, MA 02138.

1563. "Alcohol Consumption During Prohibition," by Jeffrey A. Miron and Jeffrey Zwiebel, 1991 (NBER Working Paper No. 3675)

1564. "The Long-Run Behavior of Velocity: The Institutional Approach Revisited," by Michael D. Bordo and Lars Jonung, 1990 (NBER Working Paper No. 3204)

1565. "Government Spending in a Simple Model of Endogenous Growth," by Robert J. Barro, 1990 (NBER Working Paper No. 2588)

1566. "Trade, Knowledge Spillovers, and Growth," by Gene M. Grossman and Elhanan Helpman, 1991 (NBER Working Paper No. 3485)

1567. "Quality Ladders in the Theory of Growth," by Gene M. Grossman and Elhanan Helpman, 1991 (NBER Working Paper No. 3099)

1568. "A Strategic Altruism Model in Which Ricardian Equivalence Does Not Hold," by Laurence J. Kotlikoff, Assaf Razin, and Robert W. Rosenthal, 1990 (NBER Working Paper No. 2699)
1569. "Comparison and Analysis of Productivity Growth and R and D Investment in the Electrical Machinery Industries of the United States and Japan," by M. Ishaq Nadiri and Ingmar R. Prucha, 1990 (NBER Working Paper No. 1850)
1570. "Major Macroeconomic Variables and Leading Indexes: Some Estimates of Their Interrelations," by Victor Zarnowitz and Phillip Braun, 1990 (NBER Working Paper No. 2812)
1571. "Reconciling Recent Estimates of the Marginal Welfare Cost of Taxation," by Don Fullerton, 1991 (NBER Working Paper No. 2810)
1572. "Pension Funds and Financial Innovation," by Zvi Bodie, 1990 (NBER Working Paper No. 3101)
1573. "Inward versus Outward Growth Orientation in the Presence of Country Risk," by Joshua Aizenman, 1991 (NBER Working Paper No. 2868)
1574. "Does Correcting for Heteroscedasticity Help?" by Frederic S. Mishkin, 1990 (NBER Technical Working Paper No. 88)
1575. "The Delivery of Market Timing Services: Newsletters versus Market Timing Funds," by Alex Kane and Stephen Gary Marks, 1990 (NBER Technical Working Paper No. 75)
1576. "The Sources of Fluctuations in Aggregate Inventories and GNP," by Kenneth D. West, 1990 (NBER Working Paper No. 2992)
1577. "The Nonneutrality of Inflation for International Capital Movements," by Hans-Werner Sinn, 1991 (NBER Working Paper No. 3219)
1578. "Productivity Growth in the Motor Vehicle Industry, 1970-84: A Comparison of Canada, Japan, and the United States," by Melvyn A. Fuss and Leonard Waverman, 1990 (NBER Working Paper No. 1735)
1579. "Vertical Foreclosure and International Trade Policy," by Barbara J. Spencer and Ronald W. Jones, 1991 (NBER Working Paper No. 2920)
1580. "The Stock Market and Investment," by Robert J. Barro, 1990 (NBER Working Paper No. 2925)
1581. "Inflation: Theory and Evidence," by Bennett T. McCallum, 1990 (NBER Working Paper No. 2312)
1582. "The Cyclical Behavior of the Gross Flows of U.S. Workers," by Olivier Jean Blanchard and Peter Diamond, 1990
1583. "Arbitrage and the Savings Behavior of State Governments," by Gilbert E. Metcalf, 1990 (NBER Working Paper No. 3017)
1584. "Extreme Inflation: Dynamics and Stabilization," by Rudiger Dornbusch, Federico Sturzenegger, and Holger Wolf, 1990
1585. "Stochastic Process Switching: Some Simple Solutions," by Kenneth A. Froot and Maurice Obstfeld, 1991 (NBER Working Paper No. 2998)
1586. "Popular Attitudes Toward Free Markets: The Soviet Union and the United States Compared," by Robert J. Shiller, Maxim Boycko, and Vladimir Korobov, 1991 (NBER Working Paper No. 3453)
1587. "Incentives and Government Relief for Risk," by Louis Kaplow, 1991 (NBER Working Paper No. 3007)
1588. "Asymmetric Information and Financial Crises: A Historical Perspective," by Frederic S. Mishkin, 1991 (NBER Working Paper No. 3400)
1589. "Mean Reversion in Stock Prices? A Reappraisal of the Empirical Evidence," by Myung Jig Kim, Charles R. Nelson, and Richard Startz, 1991 (NBER Working Paper No. 2795)
1590. "Domestic Violence: A Nonrandom Affair," by Helen V. Tauchen, Ann Dryden Witte, and Sharon K. Long, 1991 (NBER Working Paper No. 1665)
1591. "Comments: The Phillips Curve Now and Then," by Robert J. Gordon, 1990 (NBER Working Paper No. 3393)
1592. "International Impacts on Domestic Political Economy: A Case of Japanese General Elections," by Takatoshi Ito, 1991 (NBER Working Paper No. 3499)
1593. "Benefits and Costs of HIV Testing," by David E. Bloom and Sherry Glied, 1991
1594. "Latin America's Intraregional Trade: Evolution and Future Prospects," by Sebastian Edwards and Miguel Savastano, 1989 (NBER Working Paper No. 2738)
1595. "Could a Monetary Base Rule Have Prevented the Great Depression?" by Bennett T. McCallum, 1990 (NBER Working Paper No. 3162)
1596. "Economic Growth in a Cross Section of Countries," by Robert J. Barro, 1991 (NBER Working Paper No. 3120)
1597. "The Impact of Industrial Relations Legislation on British Union Density," by Richard B. Freeman and Jeffrey Pelletier, 1990 (NBER Working Paper No. 3167)
1598. "Heterogeneity in Panel Data: Are There Stable Production Functions?" by Jacques Mairesse and Zvi Griliches, 1990 (NBER Working Paper No. 2619)

Technical Papers Series

The following studies in the NBER Technical Working Papers series are now available (see previous issues of the *NBER Reporter* for other titles). **There is a charge of \$3.00 (\$4.00 outside of the U.S.) per paper requested. Advance payment is required on all orders. Please do not send cash.** Send orders to: Technical Working Papers, National Bureau of Economic Research, 1050 Massachusetts Avenue, Cambridge, MA 02138.

107. "Randomization and Social Policy Evaluation," by James J. Heckman, July 1991
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109. "The Independence Axiom and Asset Returns," by Larry G. Epstein and Stanley E. Zin, July 1991 (JEL Nos. G11, G12, E21, E44, D91)
110. "The Optimality of Nominal Contracts," by Scott Freeman and Guido Tabellini, August 1991 (JEL Nos. E40, G10)
111. "Estimating Event Probabilities from Macroeconomic Models Using Stochastic Simulation," by Ray C. Fair, August 1991 (JEL No. E37)
112. "Rational Frenzies and Crashes," by Jeremy I. Bulow and Paul D. Klemperer, September 1991

Bureau Books

Exchange Rate Targets and Currency Bands

Exchange Rate Targets and Currency Bands, edited by Paul R. Krugman and Marcus M. Miller, is now available from Cambridge University Press for \$49.50. This volume includes the papers presented at an NBER/Centre for Economic Policy Research conference held in Warwick, England in July 1990. It focuses on the stability of fixed exchange rate regimes in the face of speculative attacks, on international efforts since 1985 to stabilize the U.S. dollar, and on the place of the European Monetary System in the international finance system. This book should interest academic economists, graduate students, and bankers (especially central bankers).

Krugman is an NBER research associate in international studies and a professor of economics at the University of Warwick.

This volume may be ordered from: Cambridge University Press, Order Department, 110 Midland Avenue, Port Chester, New York 10573; (914) 937-9600.

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

Two New Volumes from University of Chicago Press

Politics and Economics in the Eighties, edited by Alberto Alesina and Geoffrey Carliner, is available now from the University of Chicago Press. The clothbound version is \$45.00; the paperback is \$17.95.

This volume, developed from a May 1990 conference, asks what political factors led to the changes in economic policies during the 1980s. The papers were written by political scientists and discussed by economists. Among the topics explored are voting patterns, the budget deficit, monetary policy, welfare spending, tax reform, international trade policy, minimum wage legislation, and the thrift institution crisis.

Alesina is an NBER faculty research fellow and an assistant professor of economics and government at Harvard University. Carliner is executive director of the NBER.

Economic Challenges in Higher Education, by Charles T. Clotfelter, Ronald G. Ehrenberg, Malcolm Getz, and John J. Siegfried, also is available now for \$39.95. This book offers an accessible analysis of three crucial economic issues: the growth and composition of undergraduate enrollments; the supply of faculty in the academic labor market; and the cost of operating colleges and universities.

Clotfelter is an NBER research associate and professor of public policy studies and economics at Duke University. He also is a former vice chancellor of that institution. Ehrenberg is an NBER research associate and a professor of economics in industrial relations at Cornell University. Getz is an associate professor of economics and associate provost for information science and technology at Vanderbilt University. Siegfried is a professor of economics at Vanderbilt University.

Current Working Papers

Individual copies of NBER 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 \$3.00 (\$4.00 outside of the U.S.) per paper requested. 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.

Journal of Economic Literature (JEL) subject codes, when available, are listed after the date of the Working Paper. Abstracts of all Working Papers issued since June 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.

Historical Factors in Long-Run Growth

The Market for Manufacturing Workers During Early Industrialization:

The American Northeast, 1820-60

Kenneth L. Sokoloff and Georgia C. Villaflor

Historical Working Paper No. 28

July 1991

JEL No. O42

This paper studies how labor markets operated, and how industrial workers fared, during early American industrialization. We examine four cross sections of manufacturing firm data from 1820-60, and newly constructed price indexes for classes of products in different locales.

We find that real wages rose substantially over time for all segments of the manufacturing labor force. Workers responded flexibly to changing circumstances and benefited almost immediately from the rapid expansion of the 1820s. There was impressive growth in compensation until the late 1940s or early 1850s, when progress slowed because of heavy immigration and the mechanization of a number of industries that had been labor intensive. Of course, these gains were not continuous. However, the difficult years were not caused by poorly functioning markets, rapid changes in technology, or other aspects of industrialization. On the contrary, the chief deviations from the upward trend in real wages apparently are attributable to supply-side shocks originating in the agricultural sector or in unusually large immigration flows, rather than to the path of industrial development.

NBER Working Papers

On the Labor Market Effects of Immigration and Trade

George J. Borjas, Richard B. Freeman, and Lawrence F. Katz

Working Paper No. 3761

June 1991

JEL Nos. J1, J3

In the 1980s, the wages and employment rates of less-skilled Americans fell relative to those of more-skilled workers. This paper examines the contribution of the continuing inflow of less-skilled immigrants, and the increasing importance of imports in the U.S. economy, to these trends. Our evidence indicates that both trade and immigration augmented the nation's supply of less-skilled workers, particularly those with less than a high school education. By 1988, trade and immigration increased the effective supply of high school dropouts by 28 percent for men and 31 percent for women. We estimate that approximately three to five percentage points of the decline in the relative weekly wage of high school dropouts between 1980 and 1988 can be explained by the trade and immigration flows. In addition, we suggest that from 15 to 25 percent of the 11-percentage-point rise in the earnings of college graduates relative to high school graduates from 1980-5 can be attributed to the massive increase in the trade deficit over the same period. However, the effects of trade on the college/high school wage differential diminished with improvements in the trade balance during the late 1980s.

A Comparison of the Behavior of Japanese and U.S. Inventories

Kenneth D. West

Working Paper No. 3762

July 1991

JEL Nos. E32, E22

This paper compares the cyclical and secular behavior of Japanese and U.S. inventories at the aggregate and sectoral level for 1967-87. While U.S. inventories are sharply procyclical, as is well known, Japanese inventories are only mildly procyclical. Inventory and sales do not move together in either country in the long run, in the sense that the two series do not seem to be cointegrated. In Japan, but not in the United States, there is a secular decline in the inventory-sales ratio.

Sources of Cycles in Japan, 1975-87

Kenneth D. West

Working Paper No. 3763

July 1991

JEL Nos. E32, E22

I decompose movements in aggregate inventories and output in Japan from 1975-87 into three components: those caused by cost shocks, demand shocks, and shocks from abroad. I estimate that cost shocks account for about one-tenth of the movement in GNP and one-half of the movement in inventories. Most of the remaining movement in GNP is caused by demand shocks in inventories and shocks from abroad.

Learning and Wage Dynamics

Henry S. Farber and Robert Gibbons

Working Paper No. 3764

July 1991

JEL Nos. I20, J31

We develop a dynamic model of learning and wage determination: education may convey initial information about ability, but subsequent observations of performance are also informative. Although the role of schooling declines as performance observations accumulate, its effect on wages is independent of labor market experience. Evidence from the National Longitudinal Survey of Youth is generally consistent with all the predictions of the model. We conclude that a blend of the learning model with an on-the-job training model is more plausible than either model alone.

Life Insurance Inadequacy—Evidence from a Sample of Older Widows

Alan J. Auerbach and Laurence J. Kotlikoff

Working Paper No. 3765

July 1991

JEL Nos. G22, H55

Using data from the Retirement History Survey, we study the changes in income among older women when their husbands die. The six waves of this survey provide information on roughly 1300 women who became widowed from 1960–79. Our findings indicate that about one-third of new widows experience a substantial reduction (25 percent or greater) in their living standards when their husbands die. This reduction is more severe for the younger widows and for those whose incomes were higher before their husbands died.

Couples could safeguard against severe reductions in widows' income by purchasing more life insurance. Therefore, we and other researchers in previous studies conclude that many couples fail to purchase enough life insurance to prevent a sharp drop in the wife's consumption if her husband dies. This conclusion raises the question of the role of the government in requiring the purchase of life insurance by couples, through the Social Security system's survivor insurance program. The strong and uniform evidence on the pattern and level of life insurance purchases has implications for the scale of Social Security survivor benefits, and for the appropriate mix of the total Social Security benefits between survivors and recipients.

The Peculiar Scale Economies of Lotto

Charles T. Clotfelter and Philip J. Cook

Working Paper No. 3766

July 1991

JEL No. D80

The best-selling lottery game in the United States is lotto, a parimutuel game of long odds and large jackpots. With lotto, unlike other popular lottery games (numbers and instant), there is a strong tendency for per capita sales to increase with the size of the population base. The fact that the jackpot also tends to in-

crease when population size is not a complete explanation, since the probability of winning tends to be inversely proportional to state population. We suggest that the games are more successful in large states because players tend to judge the likelihood of winning on the frequency with which someone wins; in that case, a larger state can offer a game at longer odds but with the same perceived probability of winning as a smaller state.

Foreign Direct Investment, Productive Capacity, and Exchange Rate Regimes

Joshua Aizenman

Working Paper No. 3767

July 1991

JEL Nos. F31, F21, F23, F12, F40

This paper examines the implications of the choice of foreign direct investment (FDI) and endogenous capacity on the welfare ranking of exchange rate regimes; it also analyzes the linkages between volatility of shocks and the volume of trade and investment. I construct an intertemporal model with monopolistic competition, in which producers may diversify internationally by FDI. Volatility induces both higher international trade in goods and higher FDI, and there is a possibility of increasing the productive capacity in diversified industries.

The volatility of employment in the presence of real shocks turns out to be lower under a floating exchange rate regime. In a flexible exchange rate regime, a by-product of the relative stability of employment is a lower expected GNP. In a floating exchange rate regime, nominal shocks generate international diversification, which leads to a higher capital cost of diversified industries. This implies a lower number of independent producers and of varieties offered, ultimately leading to a lower expected utility of consumption. Attempts to reduce FDI by capital controls tend to reduce welfare without affecting the results on the ranking of exchange rate regimes. I conclude that volatility effects reduce the relative attractiveness of floating exchange rates. This conclusion applies to both real and nominal shocks.

The Search for R and D Spillovers

Zvi Griliches

Working Paper No. 3768

July 1991

JEL Nos. O30, O47, D62

Potentially, R and D spillovers are a major source of endogenous growth in various recent "New Growth Theory" models. This paper reviews the basic model of R and D spillovers and then focuses on the empirical evidence for their existence and magnitude. It reviews the older empirical literature with special attention to the econometric difficulties of actually coming up with convincing evidence on this topic. Taken individually, many of the studies are flawed and are subject to a variety of reservations, but the overall impression remains that R and D spillovers are both prevalent and important.

The "Gambler's Fallacy" in Lottery Play

Charles T. Clotfelter and Philip J. Cook

Working Paper No. 3769

July 1991

JEL No. D80

The "gambler's fallacy" is the belief that the probability of an event is lowered when that event has occurred recently, even though objectively the probability of the event is known to be independent from one trial to the next. This paper provides evidence on the time pattern of lottery participation to see whether actual behavior is consistent with this fallacy. Using data from the Maryland daily numbers game, we find a clear and consistent tendency for the amount of money bet on a particular number to fall sharply immediately after it is drawn, and then gradually to recover to its former level over the course of several months. This pattern is consistent with the hypothesis that lottery players in fact are subject to the gambler's fallacy.

An Altered U.S. Housing Finance System: Implications for Housing

Patric H. Hendershott

Working Paper No. 3770

July 1991

JEL Nos. G21, G28, R21

During the 1960s and 1970s, the U.S. government closely regulated the single-family housing finance system. The regulation manifested itself in a highly specialized system with four notable characteristics: portfolio restrictions against investments in corporate assets; tax inducements to invest in residential mortgages; prohibitions against investing in adjustable rate mortgages (ARMs); and ceilings on deposit rates. All were removed in the 1980s and, not surprisingly, the housing finance system changed markedly. Between early 1982 and 1989, 40 percent of all new loans had adjustable, not fixed, rates. Savings and loans reduced their holdings of fixed rate mortgages (FRMs) by 15 to 20 percent (both whole loans and mortgage pass-throughs). Moreover, the fraction of conventional originations of FRMs pooled into pass-throughs rose from less than 5 percent before 1981 to over 50 percent after 1985. Now that borrowers can shift to lower-coupon ARMs when rates rise, and with the integration of the home mortgage market with capital markets generally, numerous studies show that the U.S. housing sector is less sensitive to rising interest rates than it was in the 1960s and 1970s.

Measurement of Output and Quality Adjustment When Hedonics Cannot Be Used: An Illustration for the Day Care Industry

Swati Mukerjee and Ann Dryden Witte

Working Paper No. 3771

July 1991

JEL Nos. J13, J24, L31, L30

In this paper we develop time-series estimates of the output and quality of day care centers in the United

States in the 1970s and 1980s. As far as we are aware, this is the first time series for day care output and quality that has been published. Using both physical and dollar measures of output, our results show very rapid growth in output, particularly during the 1980s. We find that both the real price of care and the staff/child ratio in day care centers declined between 1974 and 1988. These declines may reflect either improved productivity or a decline in the quality of care provided by day care centers.

We also illustrate a method that may be used to adjust physical measures of output for changes in quality when, as is true in the case of day care, no single market clearing price is available. The method involves the estimation of cost functions and the calculation of marginal costs for producing quality.

External Debt and Political Instability

Sule Ozler and Guido Tabellini

Working Paper No. 3772

July 1991

JEL No. F34

This paper theoretically and empirically studies the role of domestic political incentives in the accumulation of large external debts by developing countries during 1972-81. The theoretical model characterizes two equilibrium regimes: one in which the borrower is on the demand curve, and changes in the demand for loans of different sizes are accommodated by lenders. In the other regime, the borrower's credit is rationed, and loan size is determined by the perceived risk of the borrowing country. Higher political instability increases the equilibrium loan size in the first regime and decreases it in the second.

Using out-of-sample evidence, we identify the two regimes in the data. We then find that in the unconstrained regime, political instability has a significant positive effect on the loan size. It has no significant effect in the credit rationing regime. Hence, as predicted by the theory, the evidence shows a positive effect of political instability on the demand for sovereign loans.

Protecting Losers: Optimal Diversification, Insurance, and Trade Policy

S. Lael Brainard

Working Paper No. 3773

July 1991

JEL Nos. F13, J65

This paper derives a rationale based on portfolio diversification for a trade policy regime that insures returns to investment in nondiversifiable human capital. In the absence of complete insurance markets for human capital, the decentralized equilibrium involves excessive specialization. The socially optimal investment portfolio entails diversification for the reasons outlined in the capital asset pricing model. By credibly promising to protect losers ex post, the government can achieve the optimally diversified investment pat-

tern. In contrast to previous results, when human capital is mobile at some cost, two instruments are sufficient to achieve both efficient reallocation and full insurance because of the endogeneity of the initial investment decision.

Do OSHA Inspections Reduce Injuries? A Panel Analysis

Wayne B. Gray and John T. Scholz

Working Paper No. 3774

July 1991

JEL Nos. J28, K32

Using data on injuries and OSHA inspections for 6842 large manufacturing plants between 1979 and 1985, we find that OSHA inspections significantly reduce injuries. This effect comes exclusively from inspections that impose penalties; inspections that do not impose penalties appear to have no effect on injuries. Plants that are inspected (and penalized) in a given year experience a 22 percent decline in their injuries in the following few years. In our sample, local OSHA enforcement is predicted to have reduced injuries by about 2 percent.

We take advantage of the panel nature of our data to test for a number of potential biases: autocorrelated injuries; plant-specific fixed effects that are correlated with both inspections and injuries; and endogeneity of inspections (injuries causing inspections). These biases lead us to use the percentage change in injuries, rather than injury levels, as the dependent variable for our estimation. Our analysis shows that the estimated effect of inspections on the percentage change in injuries is not affected significantly by these biases, and thus seems to reflect a "deterrence" effect of OSHA inspections on injuries.

Floating Exchange Rates in Peru, 1950-4

Richard K. Lyons

Working Paper No. 3775

July 1991

JEL No. F31

I test three potentially complementary models in an effort to capture the fundamentals that underlaid the market's determination of Peru's floating exchange rate from 1950-4: 1) an expectational purchasing power parity (PPP) model that maintains that asset market forces were driving the exchange rate to its perceived PPP level; 2) a flexible-price monetary model; and 3) a model along the lines described by Tsiang (1957) that emphasizes world prices for Peruvian exports as a fundamental determinant. I find that the expectational PPP model not only dominates the others, but also fits quite well.

Obstacles to Transforming Centrally Planned Economies:

The Role of Capital Markets

Guillermo A. Calvo and Jacob A. Frenkel

Working Paper No. 3776

July 1991

JEL Nos. P21, P22, P23, P26

This paper identifies obstacles hindering the transformation of centrally planned economies (CPEs) into well-functioning market economies. The analysis is motivated by the recent experience with economic transformation and restructuring in Eastern Europe and the U.S.S.R. The economic system in CPEs is highly distorted. Prices do not represent real social costs; incentives systems are absent; losses of unprofitable state-owned enterprises are financed automatically; legislation vital for the functioning of markets is not in place; private ownership and property rights are underdeveloped; bankruptcy laws are absent; markets are missing; shortages prevail; and, occasionally, inflation is high.

The obstacles we identify relate to: anticipatory dynamics; monetary overhang and the budget; and underdeveloped credit markets. We show that these obstacles inhibit the effectiveness of price reform, monetary and credit policies, and trade liberalization. In focusing on various ways to remove the obstacles, we examine the implications of "cleaning" the balance sheets of enterprises and banks of nonperforming loans, and ways to enhance credibility. In the absence of such measures, privatization will be difficult, because the necessary information about creditworthiness of firms is lacking.

An Analysis of the Nature of Unemployment in Sri Lanka

William T. Dickens and Kevin Lang

Working Paper No. 3777

July 1991

JEL No. J64

Sri Lanka has a significant problem with chronic unemployment. Depending on the time period and the definition of unemployment, it varies from the low teens to over 20 percent. Nearly all of this unemployment is concentrated among young people who are looking for their first job. Typical spells of unemployment last four years or more. Although previous authors have blamed unemployment on overeducation, a closer examination shows that once sex, sector, and age are controlled for, the relationship between education and unemployment disappears for urban youth and is weakened significantly for rural youth.

We believe that unemployment is generated in part by queuing for high-wage government jobs. We suggest that one reason the unemployed do not take other employment while queuing may be a perceived or real government preference for hiring the unemployed.

If our interpretation is correct, replacing government's hiring preference for the unemployed with a normal preference for workers who have demonstrated ability in previous work experience would reduce unemployment. A substantial fraction of the currently unemployed youth would begin actively seeking employment that would supply them with the requisite job experience to obtain government employment.

What Went Wrong? The Erosion of Relative Earnings and Employment Among Young Black Men in the 1980s

John Bound and Richard B. Freeman

Working Paper No. 3778

July 1991

This paper shows a widening in black-white earnings and employment gaps among young men from the mid-1970s through the 1980s that differs among subgroups. Earnings gaps increased most among college graduates and in the Midwest, while gaps in employment-population rates grew most among high school dropouts. We attribute the differential widening to distinct shifts in demand for subgroups caused by changes in industry and regional employment, the falling real minimum wage and deunionization, the growth of the relative supply of black-to-white workers that was marked among college graduates, and to increased crime, especially among high school dropouts. The differential factors affecting the groups highlights the economic diversity of black Americans.

International Fiscal Policy Coordination and Competition: An Exposition

Assaf Razin and Efraim Sadka

Working Paper No. 3779

July 1991

JEL Nos. F4, F3

This paper highlights the key considerations necessary to analyze international tax competition and to assess the desirability of harmonization of international taxes. We analyze a Nash-Cournot international tax competition for competing countries that: 1) cannot exercise significant market power in the world economy when setting tax rates; 2) incorporate the indirect effect on world prices into the tax design; and 3) are unable to commit themselves to a preannounced path of taxes for the future. We use basic principles of international taxation under full integration of goods and capital world markets.

How Valuable Is Patent Protection? Estimates by Technology Field Using Patent Renewal Data

Mark Schankerman

Working Paper No. 3780

July 1991

JEL Nos. O30, O31, O34

This paper estimates the private value of property rights conferred by patent protection for different fields

of technology and countries of ownership. Using a new dataset on patent renewals in France from 1969-87, I show that patent protection is a significant, but not the major, source of private returns to inventive activity. Its importance varies sharply across fields of technology. I also quantify the equivalent subsidy to R and D generated by the patent system and characterize variations in the value of patent rights across fields of technology, countries of ownership, and time, exploring the determinants of those differences.

Taxes and the Choice of Organizational Form

Roger H. Gordon and Jeffrey K. MacKie-Mason

Working Paper No. 3781

July 1991

JEL Nos. G32, H32

One of the most basic distortions created by the double taxation of corporate income is the disincentive to incorporate. This paper investigates how the aggregate allocation of assets and taxable income in the United States between corporate and noncorporate forms of organization from 1959-86 responded to that tax distortion.

In theory, profitable firms should shift out of the corporate sector when the tax distortion to incorporating is larger than the benefits of incorporation; the converse is true for firms with tax losses. Our results support these forecasts and hold across a wide variety of specifications and measures of the tax variables. However, the measured effects are small, casting doubt on the economic importance of tax-induced changes in organizational form.

Long-Term Contracting and Multiple-Price Systems

R. Glenn Hubbard and Robert J. Weiner

Working Paper No. 3782

July 1991

JEL Nos. E64, E3, F30

This paper examines product markets in which long-term contracts and spot transactions coexist. Such markets are characterized by "multiple-price systems": adjustment to supply and demand shocks occurs through spot prices, while contract prices either are fixed or adjust slowly. We derive the existence of contracts, as well as the equilibrium fraction of spot trade, in the framework of an optimizing model. We also analyze the effects of shocks on market equilibrium when some buyers and sellers are contractually "locked in." We use the model to interpret the change in the copper market from a multiple-price system to one characterized solely by spot trade.

The Australian Pharmaceutical Subsidy Gambit: Transmuting Deadweight Loss and Oligopoly Rents to Consumer Surplus

Mark Johnston and Richard J. Zeckhauser

Working Paper No. 3783

July 1991

Australia pays less than other developed nations for pharmaceuticals: only about 45 percent as much as the

United States pays. This occurs because of an ingenious price-contingent subsidy scheme, which turns deadweight loss (caused by pricing above marginal cost) into consumer surplus. Pharmaceutical companies are offered a per-unit subsidy from the government for selling their product at marginal cost in the Australian market. The subsidy is calibrated to enable the companies to recover what they otherwise would receive in monopoly profits.

When two or more firms possess market power for a particular therapeutic use, the subsidy scheme creates a game—in effect, a race—to determine who joins first and reaps most of the benefits. Properly constructed, the game transfers significant oligopoly profits to the consumer.

Australia's success—receiving benefits equal to 15 percent of its drug expenditures—stems in part from its size and geographic isolation. Australia can “free ride” on drug research and work the scheme almost without notice.

Fear of Flying? Economic Analyses of Airline Safety

Nancy L. Rose

Working Paper No. 3784

July 1991

JEL Nos. L93, J28

The safety of the commercial airline industry has attracted considerable public attention and debate since economic deregulation in 1978. Some research investigates whether heightened public concerns about air safety derive from objective increases in accident risks. A second body of literature analyzes heterogeneity in carriers' safety records as a means of learning about factors that influence safety performance. A third area of inquiry explores the effectiveness of market incentives in constraining the safety provision of firms. This paper describes the progress made in each of these areas.

Competition and Price Dispersion in the U.S. Airline Industry

Severin Borenstein and Nancy L. Rose

Working Paper No. 3785

July 1991

JEL No. L93

This paper analyzes the substantial dispersion in the prices that an airline charges to different customers on the same route. The expected absolute difference in fares between two such passengers is about 36 percent of the airline's average ticket price on the route.

The pattern of price dispersion does not seem to be explained solely by differences in cost. Dispersion is higher on more competitive routes, possibly reflecting a pattern of discrimination against customers who are less willing to switch to alternative flights or airlines. We argue that the data support an explanation based on theories of price discrimination in monopolistically competitive industries.

The Theory of Allocation and Its Implications for Marketing and Industrial Structure

Dennis W. Carlton

Working Paper No. 3786

July 1991

JEL Nos. D40, D45, D80, L10, L16

This paper identifies a cost of using the price system and from that develops a general theory of allocation. The theory explains why a buyer's stochastic purchasing behavior matters to a seller. This leads to a theory of optimal customer mix much akin to the theory of optimal portfolio composition. It is the job of a firm's marketing department to put together this optimal customer mix.

A dynamic pattern related to Ramsey pricing emerges as the efficient pricing structure. Price no longer equals marginal cost nor is it the sole mechanism used to allocate goods. It is optimal for long-term relationships to emerge between buyers and sellers, and for sellers to use their knowledge about buyers to ration goods during periods when demand is high. This rationing can take the form of refusing to sell to new customers and of putting established customers on quotas. The evidence shows that this form of rationing, although foreign to the thinking of most economists, characterizes several industries.

The theory provides an important incentive for a firm to exist, namely to facilitate trade among its customers. The theory also provides a convincing explanation for the hostility that new futures markets face from established firms in the industry. It shows that several practices, such as price differences among consumers, and swapping product with rivals, can be the result of competition and not market power.

Growth in Cities

Edward L. Glaeser, Hedi D. Kallal,

Jose A. Scheinkman, and Andrei Shleifer

Working Paper No. 3787

July 1991

JEL Nos. O18, R00

Recent theories of economic growth—including Romer (1986), Porter (1989), and Jacobs (1969)—have stressed the role of technological spillovers in generating growth. Because such knowledge spillovers are particularly effective in cities, where communication is more extensive, data on the growth of industries in different cities allow us to test some of these theories.

Using a new dataset on the growth of large industries in 170 U.S. cities between 1956 and 1987, we find that local competition and urban variety, but not regional socialization, encourage employment growth in industries. The evidence suggests that important knowledge spillovers might be between, rather than within, industries, consistent with the theories of Jacobs.

Ethnic Capital and Intergenerational Mobility

George J. Borjas

Working Paper No. 3788

July 1991

This paper analyzes the extent to which ethnic dif-

ferences in skills are transmitted across generations. I assume that ethnicity acts as an externality in the process of human capital accumulation. The skills of the next generation depend on their parents' inputs and on the quality of the ethnic environment in which they make those investments, or "ethnic capital." The empirical evidence reveals that the skills of today's generation depend not only on the skills of their parents, but also on the average skills of their ethnic group in their parents' generation.

Sex Discrimination by Sex:

Voting in a Professional Society

Alan E. Dillingham, Marianne A. Ferber,

and **Daniel S. Hamermesh**

Working Paper No. 3789

July 1991

JEL No. J71

Economic theories of discrimination usually are based on tastes. However, the huge body of empirical studies considers the discriminatory outcomes that are the reduced-form results of interactions between tastes and opportunity sets. None of those studies directly examines tastes for discrimination, nor considers people's willingness to trade off other characteristics to indulge their tastes. We study these trade-offs using a dataset on votes for officers in a professional association. The evidence shows that female voters are much more likely to vote for female than for male candidates, and that other affinities between them and a candidate have little effect on their choices. Male voters are slightly more likely to vote for female than male candidates, but their choices are altered easily by other affinities to a candidate.

Characterizing Predictable Components in Excess Returns on Equity and Foreign Exchange Markets

Geert Bekaert and Robert J. Hodrick

Working Paper No. 3790

July 1991

JEL Nos. F31, G12

We use lagged excess returns, dividend yields, and forward premiums as instruments to characterize predictable components in excess rates of returns in major equity and foreign exchange markets. Vector autoregressive (VAR) techniques demonstrate one-step-ahead predictability and provide implied long-horizon statistics. We also estimate latent variable models as constrained counterparts to the VARs. We relate the predictability of returns to asset pricing models by examining the volatility bounds on intertemporal marginal rates of substitution.

Pervasive Shortages under Socialism

Andrei Shleifer and Robert W. Vishny

Working Paper No. 3791

July 1991

JEL Nos. P21, P22, P23

We present a new theory of pervasive shortages under socialism, based on the assumption that the plan-

ners are self-interested. Because the planners—meaning bureaucrats in the ministries and managers of firms—cannot keep the official profits that firms earn, it is in their interest to create shortages of output and to collect bribes from the rationed consumers. Unlike official profits, bribes are not turned over to the state. Therefore, shortages enable the key decisionmakers who collect bribes to profit personally. This theory suggests that an increase in the official price of a good might reduce output. It also suggests that market socialism is bound to fail, even without computational complexities facing the planners.

Optimal Incentive Contracts in the Presence of Career Concerns: Theory and Evidence

Robert S. Gibbons and Kevin J. Murphy

Working Paper No. 3792

July 1991

JEL Nos. J33, J41, D8, C73

This paper studies career concerns (that is, concerns about the effects of current performance on future compensation) and their effect on optimal incentive contracts. Career concerns arise frequently: whenever a competitive market uses a worker's current output to update its belief about the worker's ability and that information influences future wages (or wage contracts). Career concerns are stronger when a worker is further from retirement, because a longer prospective career increases the return to changing the market's belief.

With career concerns, the optimal compensation contract optimizes *total* incentives: implicit incentives from career concerns and explicit incentives from the compensation contract. Thus, the explicit incentives from the optimal compensation contract should be strongest when a worker is close to retirement. We find empirical support for this prediction in the relationship between the compensation of chief executives and stock market performance.

Are Economists' Traditional Trade Policy Views Still Valid?

Robert E. Baldwin

Working Paper No. 3793

July 1991

JEL Nos. F13, F12

Recent analysis of trade policies under imperfectly competitive market conditions and in situations in which trade in high technology products is important have raised doubts as to whether economists should continue their traditional opposition to trade taxes and subsidies. This paper evaluates the new theoretical arguments for interventionist trade policies. It compares them with the traditional arguments for and against free trade; investigates the empirical evidence supporting the conditions assumed in the new models; appraises the realism of the behavior assumptions of these models and the sensitivity of their conclusions to changes in these assumptions; and considers the implications for political economy of these conclusions. The general conclusion is that there are serious practical difficulties

with the interventionist arguments of the "new" trade theorists, as they would themselves recognize. But difficulties also exist with such traditional arguments for trade intervention as the terms-of-trade case for protection. However, the new industrial organization approach to trade theory already has provided valuable insights into trade behavior in international markets and promises to provide many more as more realistic behavior models are developed.

Corporate Restructuring and Investment Horizons

Bronwyn H. Hall

Working Paper No. 3794

July 1991

JEL Nos. G14, G30

The recent wave of corporate restructuring in the United States has been accused of shortening the investment horizons of U.S. managers. This paper surveys the empirical and case study evidence on restructuring and investment behavior, and reaches the following conclusions: 1) A large fraction of the restructurings were motivated by synergistic or other efficiency-enhancing reasons and have little to do with investment horizons. 2) Massive shifts toward debt in the capital structure of manufacturing firms, often induced by hostile takeover threats, are accompanied by reduced investment of all kinds, particularly in a few industries that are characterized by "stable" technology and cost-based innovative strategies. 3) The evidence is consistent with optimizing behavior of firms faced with a lower relative price of debt to equity and a higher overall cost of capital during the 1980s, but there are still doubts about whether the U.S. market for corporate control elicits the correct level of long-run investment. Thus the paper concludes with a discussion of the evidence on cross-country differences in the financing of investment and the market for corporate control, and with suggestions for future research in this area.

Assessing Target Zone Credibility: Mean Reversion and Devaluation Expectations in the EMS

Lars E. O. Svensson

Working Paper No. 3795

July 1991

JEL Nos. F31, F33

This paper estimates devaluation expectations for six European Monetary System currencies relative to the Deutsche mark, for March 1979–May 1990. The estimates are constructed by subtracting estimated expected rates of depreciation within the exchange rate band from interest rate differentials. Exchange rates within exchange rate mechanism bands display mean reversion rather than random walk (unit root) behavior. The adjustment is essential, since expected rates of depreciation within the band usually are of about the same magnitude as interest rate differentials.

Vanishing Tax on Capital Income in the Open Economy

Assaf Razin and Efraim Sadka

Working Paper No. 3796

August 1991

JEL Nos. F1, H1

The increased integration of the world capital market implies that the supply of capital becomes more elastic, and therefore potentially a less efficient base for taxation. In general, the optimal taxation of capital income is subject to two conflicting forces. The return on existing capital is a pure rent that is efficient to fully tax away. On the other hand, taxing the returns on investment in new capital would retard growth, thus generating inefficiencies. Capturing these considerations, we carry out a simple optimal tax analysis for an open economy, which is fully integrated in the world capital markets. The analysis identifies well-defined circumstances in which the capital income tax vanishes.

Incomplete Appropriability of R and D and the Role of Strategies and Cultural Factors in International Trade: A Japanese Case

Rama Ramachandran, Ryuzo Sato,

and **Shunichi Tsutsui**

Working Paper No. 3797

August 1991

JEL Nos. O32, O53, F12

One of the proudest achievements of classical and neoclassical economics is the derivation of the superiority of free trade. This result is obtained by assuming constant returns to scale, perfect competition, and absence of externalities. The recent realization that the incomplete appropriability of R and D is a main source of externalities, and hence the effect of R and D on national welfare is potentially subject to strategic manipulations, necessitates a careful examination of these assumptions.

This paper discusses R and D and diffusion of technology in international trade from two different perspectives. First we consider the role of cultural, social, and historical factors, reviewing how Japan has appropriated foreign technology. Then we survey three strategic trade models to obtain some insights into the role of R and D and diffusion of technology in the context of imperfect competition. We discuss: the effectiveness of R and D policies by a national government; and the impact of R and D policies, and the diffusion of technology, on the incentive to do R and D and the outcome of trade.

Information Handling and Firm Performance: Evidence from Reverse LBOs

Francois Degeorge and Richard J. Zeckhauser

Working Paper No. 3798

August 1991

JEL Nos. D82, G32, G34

We investigate the transition from private to public ownership of companies that previously had been sub-

ject to leveraged buyouts (LBOs). As they go to the public markets for equity, such firms face a problem of information asymmetry. Behavioral effects also are likely to be at work.

We show that the combination of informational and behavioral effects will cause firms to handle information in particular ways. This leads to an equilibrium pattern in which disappointing performance after the initial public offering should be expected.

We find empirical support for this theory by studying 62 reverse LBOs that went public between 1983 and 1987. There is strong evidence that the performance of the reverse LBOs before going public overestimates their likely performance after the initial public offering. The market appears to anticipate this pattern.

A Theory of War Finance

Herschel I. Grossman and Taejoon Han

Working Paper No. 3799

August 1991

JEL Nos. H56, H63

This paper analyzes the financial and war-spending policies of a state that faces a war in which: 1) defeat would result in the loss of sovereign power; and 2) the material consequences, conditional on avoiding defeat, are stochastic. We explicitly account for the historical experiences of lenders, who face debt repudiation if the borrower state is defeated, and who face partial default if the material consequences of the war are unfavorable for the debtor even if it avoids defeat. The state uses war debt to smooth expected consumption intertemporally in response to temporary war spending. The state also uses contingent debt servicing to ensure realized consumption against the risk associated with the material consequences of the war.

Labor Productivity and Market Competition in Japan

Guoen Liu, Tadashi Yamada, and Tetsuji Yamada

Working Paper No. 3800

August 1991

JEL Nos. J24, L1, O32, O53

This study focuses on the influence of labor, capital, R and D, technological knowledge, and other factors on labor productivity in different manufacturing industries. We also examine the competitiveness of these manufacturing industries in the Japanese market.

Our results indicate that labor productivity is high relative to capital productivity in most of the Japanese manufacturing industries. The quality of capital (for example, advanced technology) generally is more important to increasing productivity than the quantity of capital. This implies that workers in Japanese manufacturing industries are using capital of high quality, not of large quantity. Japanese firms therefore seem to be trying to assess how to make production more efficient, and how to improve the quality of products.

We also show that R and D in Japan is important for improving product technology in the food, spinning,

textile, paper products, electrical machinery and equipment, and communication equipment industries. R and D is also important for process technology in the chemicals, drugs and medicines, petroleum products, machinery, motor vehicles, and transportation equipment industries. While the high turnover rate of technology unfavorably affects electrical machinery, electrical equipment, communications equipment, chemicals, drugs and medicines, and petroleum products, the other manufacturing industries enjoy a productive stock of technological knowledge. Despite the fact that Japanese manufacturing industries face stiff competition in domestic product markets, they may not be as price competitive in the world market as previously believed.

Crime Rates versus Labor Market Conditions: Theory and Time-Series Evidence

Johan M. Kang, Tadashi Yamada, and Tetsuji Yamada

Working Paper No. 3801

August 1991

JEL Nos. J4, J6

This paper examines the impact of labor market conditions, represented by male civilian unemployment rates, on seven major categories of crime. We propose a theoretical model from which the positive relationship between unemployment and crime is derived. The model shows that the concurrent countercyclical movements of the unemployment and crime rates are consistent with U.S. time-series data from 1970:1 to 1983:4. Thus, we suggest that an increase in the unemployment rate triggers a subsequent increase in the crime rate. Further, we find that there are economic forces and motivations behind the positive relationship between the unemployment rate and the crime rate.

The Joint Consumption/Asset Demand Decision: A Case Study in Robust Estimation

Marjorie Flavin

Working Paper No. 3802

August 1991

JEL Nos. D91, E21, C21

This paper uses a previously unexploited dataset—the Michigan Survey of Consumer Finances—to ask whether the finding that consumption tracks current income more closely than is suggested by the permanent income hypothesis can be attributed to borrowing constraints. Using household data on income and asset stocks, I study the saving side of the consumption/saving decision and thus imply a comprehensive concept of consumption.

The results indicate that households do use asset stocks to smooth their consumption, although this smoothing is far from complete. However, there is no evidence that the excess sensitivity of consumption to current income is caused by borrowing constraints.

Pricing, Patent Loss, and the Market for Pharmaceuticals

Richard G. Frank and David S. Salkever

Working Paper No. 3803

August 1991

JEL No. I1

Empirical studies suggest that entry of generic competitors results in minimal decreases, or even increases, in brand-name drug prices, and sharp declines in brand-name advertising. This paper examines circumstances under which this empirical pattern could be observed.

We focus on models in which the demand for brand-name pharmaceuticals is divided into two segments, only one of which is cross-price-sensitive. Brand-name firms are assumed to set price and advertising; they allow for responses by generic producers who take the decisions of brand-name firms as given. Brand-name price and advertising responses to entry depend upon the properties of the reduced-form demand function for brand-name drugs.

We also examine the implications for brand-name price levels, and for the brand-name price response to entry of health sector trends (such as increasing health maintenance organization enrollments) that may expand the size of the cross-price-sensitive segment of the market.

The Nonequivalence of High School Equivalents

Stephen V. Cameron and James J. Heckman

Working Paper No. 3804

August 1991

This paper analyzes the causes and consequences of the growing proportion of people who achieve high school certification by exam rather than through graduation from high school. Statistically, exam-certified high school equivalents are not distinguishable from high school dropouts. Both have comparably poor wages, earnings, hours of work, unemployment experiences, and job tenure. That is the case whether or not ability measures are used to control for differences.

Whatever differences are found among exam-certified equivalents, high school dropouts, and high school graduates are explained by their completed years of schooling. The only payoff to exam certification arises from its value in opening up opportunities for post-secondary schooling and training. However, exam-certified equivalents receive lower returns to most forms of post-secondary education and training than high school graduates do.

Recently, there has been growth in direct government subsidies to adult basic education programs that result in exam certification. There also has been growth in government subsidies to post-secondary schooling programs that require certification in order to qualify for benefits. These two sources explain the rapid growth in the use of exam certification despite its low economic returns.

International Economic Transactions: Issues in Measurement and Empirical Research

Peter Hooper and J. David Richardson

Working Paper No. 3805

August 1991

This paper summarizes a forthcoming book that describes issues and recent innovations in the measurement of international transactions. A number of distinguished authors assess the measurement of data on trade in merchandise, services, and foreign-direct-investment claims. Others assess international prices and the data that measure comparisons of inputs and outputs internationally. In many cases, the chapters tabulate the data and illustrate their application to recent research questions. The book emphasizes U.S. international data, but frequently highlights those of other countries as well.

Growing international interdependence, and structural and technological change, raise a number of important issues regarding, for example, computer prices, productivity, international convergence of income, service provision from overseas affiliates, and proper valuation of direct investment stakes.

Exchange Rate Expectations and the Risk Premium: Tests for a Cross Section of 17 Currencies

Menzie Chinn and Jeffrey A. Frankel

Working Paper No. 3806

August 1991

We use survey data on a broad cross section of 17 currencies to determine whether the forward discount moves in response to changes in expectations of depreciation, or in the risk premium. We find that changes in expected depreciation are quantitatively significant. However, in contrast to earlier studies involving only four or five major currencies, this study finds that variation in the risk premium constitutes a large part of variation in the forward discount.

Are Exchange Rate Expectations Biased? Tests for a Cross Section of 25 Currencies

Menzie Chinn and Jeffrey A. Frankel

Working Paper No. 3807

August 1991

We investigate the properties of exchange rate forecasts with a dataset encompassing a broad cross section of currencies. Our key finding is that expectations appear to be biased in our sample. This result is robust to the possibility of random measurement error in the survey measures. Investors would be better off placing less weight on their forecasts of the forward rate, and more on the current spot rate.

The Effects of Product Market Competition on Collective Bargaining Agreements:

The Case of Foreign Competition in Canada

John M. Abowd and Thomas Lemieux

Working Paper No. 3808

August 1991

JEL Nos. J50, F12

This paper studies the connections among product market conditions, negotiated wage settlements, and union employment in the presence of foreign competition shocks. We exploit the fact that in a small, open economy, such as Canada, the prices of imports and exports should represent pure demand shocks.

Based on a sample of collective bargaining agreements from 1965 to 1983, we estimate that a 1 percent change in value added per worker increases the negotiated wage settlements by 0.25 percent. A 1 percent change in firm-specific sales increases employment by 0.19 percent.

Empirical Evidence on European Dual Exchange Rates, and Its

Relevance for Latin America

Nancy P. Marion

Working Paper No. 3809

August 1991

JEL No. F31

This paper uncovers some important empirical regularities for the European dual exchange markets of the early 1970s, examines some of the stylized facts about the Latin American dual-rate regimes, and assesses whether there are strong parallels between the two. It concludes that one should be cautious about applying the lessons from the European experiences to the Latin American ones.

Short- and Long-Run Externalities

Eric J. Bartelsman, Ricardo J. Caballero, and Richard K. Lyons

Working Paper No. 3810

August 1991

JEL Nos. D24, D62, E63

We build upon previous work on external economies in manufacturing [Caballero and Lyons (1989, 1990)] by providing new evidence helpful for discriminating among different types of externalities. We investigate four-digit-level input-output relationships. We find that, over shorter horizons, the linkage between an industry and its customers is the most important factor in the transmission of externalities. This suggests that transactions' externalities accruing primarily to the seller, and/or activity-driven demand externalities, are significant for explaining the short-run behavior of measured total factor productivity. Over longer horizons, on the other hand, it is the activity level of *suppliers* that is more important. This suggests that external effects also are operating through intermediate goods linkages.

The Real Exchange Rate, Exports, and Manufacturing Profits: A Theoretical Framework with Some Empirical Support

Richard H. Clarida

Working Paper No. 3811

August 1991

JEL No. F41

This paper investigates the relationship among manufacturing profits, exports, and the real exchange rate. Using Marston's (1990) model of pricing-to-market, I derive an equation that restricts the long-run relationship among real U.S. manufacturing profits, domestic sales, the real exchange rate, real unit costs, the U.S. relative price of output, and foreign sales. I show that the elasticity of real profits with respect to the real exchange rate is bounded below by the product of one minus the long-run pass-through coefficient, and the ratio of export revenues to total profits. Even after taking output, costs, and relative prices into account, real exchange rate fluctuations appear to have a sizable and statistically significant influence on real U.S. manufacturing profits. Also, real exchange rate changes potentially can influence national savings.

Cointegration, Aggregate Consumption, and the Demand for Imports: A Structural Econometric Investigation

Richard H. Clarida

Working Paper No. 3812

August 1991

JEL No. F41

This paper uses a two-goods version of Hall's (1978) representative-agent, permanent-income model to derive a structural equation for import demand for non-durable consumer goods. Under the restriction that taste shocks are stationary, the model implies that the logs of imports, domestic goods, and the relative price of imports are cointegrated.

I estimate the long-run price elasticity of import demand to be -0.95 . The elasticity of import demand with respect to a permanent increase in real spending is 2.2.

The message of this paper is that, at least for nondurable consumer goods, it is possible to interpret the traditional import demand equation as a cointegrating regression, and to interpret the price and expenditure elasticities estimated from such an equation as a cointegrating vector. Estimates of the vector can be used to recover estimates of the utility parameters of the representative household.

Endogenous Comparative Advantage, Government, and the Pattern of Trade

Richard H. Clarida and Ronald Findlay

Working Paper No. 3813

August 1991

JEL No. F11

This paper explores the relationship between government policy and comparative advantage in a neo-

classical model of international trade. We study the role that government policy can play in the determination and promotion of comparative advantage, and in the maximization of the gains that may be obtained from international trade. We also study the influence that international trade can exert on the scale and scope of government activity.

The paper tries to reconcile a positive theory of trade and government with the apparent shift in measured productivity that often follows an opening to trade. We conclude by interpreting the model in the context of recent policy discussions of such issues as structural impediments, competitiveness, and the role of trade policy.

Entry, Dumping, and Shakeout

Richard H. Clarida

Working Paper No. 3814

August 1991

JEL Nos. F10, F13

This paper investigates the relationship among entry, demand, and dumping in the context of a two-country Ricardian model of international trade. Dumping—the export of goods at a price below average cost—can arise in the free trade equilibrium if the two countries have different initial stocks of technological knowledge.

As in Jovanovic (1982), I assume that firms in one of the countries can acquire knowledge about the technology used to produce one of the goods only by actually producing it. Because all firms are *ex ante* identical in one of the countries, and because firms that are efficient *ex post* earn positive rents in equilibrium, competition for these rents can result in entry to the point that the equilibrium price is driven below average cost. If world demand is high enough, entry among *ex ante* identical firms can push the world price below the opportunity cost of production of new entrants in one country. That country initially can export the dumped good in equilibrium.

Interestingly, and in contrast to models of cyclical downturns, dumping will not occur with endogenous entry if world demand is too low. Despite the fact that high world demand induces so much entry that price is driven below opportunity cost, welfare in both the dumping (exporting) country and the importing country improve in the free trade dumping equilibrium relative to autarky.

Productivity in the Transportation Sector

Robert J. Gordon

Working Paper No. 3815

August 1991

JEL Nos. L5, O4, R4

This paper is a comprehensive study of measurement and substantive issues that arise in determining the rate of multifactor productivity (MFP) growth in the transportation industry over the postwar period, 1948–87. Two government agencies provide official

data on output and employment that conflict markedly for railroads, airlines, and trucking. I identify the source of the conflicts and select the best of the government indexes for further study. I conclude that improved data reduce the magnitude of the post-1973 productivity slowdown in transportation MFP growth from a previously reported 2.5 percent per annum to just 0.5 percent. The effect of deregulation has been mixed: MFP growth accelerated markedly for railroads in 1978–87 compared to pre-1978, but slowed sharply for airlines and trucking.

I present new results on output quality for airlines, particularly for the period of deregulation. Contrary to the standard view, deregulation has not substituted circuitous routings through hubs for nonstop flights previously available. Instead, the establishment of new hubs has greatly increased the number of nonstop routings available, and remarkably few nonstop routes have been discontinued. I estimate the value of time saved by the improved routings, and of the offsetting cost in time of extended scheduled flight times that are the result of increased congestion. Such estimates of the value of time are swamped by the huge contribution to welfare from manufacturers of aircraft and engines. The time saving from the “invention of air travel” for 1989 is valued at 400 percent of domestic airline revenue and 3.5 percent of GNP.

I also provide alternative measures of capital input, based on new quality-adjusted equipment deflators, for airlines, railroads, and trucking. These uniformly increase faster in the earlier postwar years in the last decade. Consequently, they imply a smaller decline in MFP growth than reported in official data sources. However, new estimates of the input of government expenditures on airports, air traffic control, and highways, do not appreciably change the pattern of postwar MFP growth in transportation.

Stabilization and Liberalization Policies in Central and Eastern Europe:

Lessons from Latin America

Sebastian Edwards

Working Paper No. 3816

August 1991

JEL Nos. E63, P51, O57

This paper discusses some economic problems faced by the Eastern European nations in light of recent experiences in Latin America. I argue first that in spite of some important cultural, political, and institutional differences, there are some similarities between Eastern European and Latin American economic problems. My discussion concentrates on four specific areas: 1) monetary overhang and repressed inflation; 2) fiscal imbalances and inflationary pressures; 3) deindexation and inflationary inertia; and 4) the use of the exchange rate as a nominal anchor. I argue that using a price jump to solve the money overhang problem in Chile in 1973 created high inflationary expectations, increasing the inertia of inflation. I also point out that the Latin Ameri-

can experience tells a serious cautionary tale regarding the use of nominal exchange rate anchors. More often than not, these types of policies have resulted in overvaluation, losses in international competitiveness, and eventually in external sector crises. Comparing the Chilean and Mexican stabilization programs suggests that the use of exchange rate anchors will be more effective (and more credible) if the fixing of the exchange rate is accompanied by other policies geared at breaking inertia. Among these policies, the most important is the abandonment of wage rate indexation.

The Great Compression: The Wage Structure in the United States at Midcentury

Claudia Goldin and Robert A. Margo

Working Paper No. 3817

August 1991

JEL Nos. J30, N32

The structure of wages narrowed considerably during the 1940s, increased slightly during the 1950s and 1960s, and expanded greatly after 1970. This paper returns attention to the decade that witnessed an extraordinary compression in the wage structure. In the 1940s, wages narrowed by education, job experience, region, and occupation, and the compression occurred within these categories as well. For white men, one measure of the differential in wages was 1.414 in 1940 but 1.060 in 1950. By 1985, it had returned to its 1940 level. Thus, the recent widening of the wage structure has returned wage dispersion to its pattern of 50 years ago.

We explore various explanations for the rapid compression in the wage structure during the 1940s, and for its maintenance during the subsequent decade or more. First we assess the hypothesis that the Great Depression left the wage structure in 1939 more unequal than in the late 1920s. We find evidence to the contrary. We suggest that World War II and the National War Labor Board share some of the credit for the Great Compression. But much of the credit belongs to a rapid increase in the demand for unskilled labor at a time when educated labor was increasing greatly in number. These same factors caused the wage structure to remain compressed until its expansion during the past two decades.

The Significance of Technical Trading-Rule Profits in the Foreign Exchange Market: A Bootstrap Approach

Richard M. Levich and Lee R. Thomas

Working Paper No. 3818

August 1991

JEL Nos. F31, G14, G15

This paper presents new evidence on the profitability and statistical significance of technical trading rules in the foreign exchange market. We use a new database: currency futures contracts for 1976–90. We also

implement a new testing procedure based on bootstrap methodology. Using this approach, we generate thousands of new exchange rate series constructed by random reordering of each original series. We then measure the profitability of the technical rules for each new series. We assess the significance of the profits in the original series by comparing them to the empirical distribution of results derived from the thousands of randomly generated series.

Overall, our results suggest that simple technical trading rules very often have led to profits that are highly unusual. Splitting the entire 15-year sample period into three five-year periods reveals that, on average, the profitability of some trading rules declined from 1986–90, although profits remained positive (on average) and significant in many cases.

The European Monetary System: Credible at Last?

Jeffrey A. Frankel and Steven Phillips

Working Paper No. 3819

August 1991

JEL Nos. F36, F31, F33, F4

We update tests of the credibility of the EMS exchange rate target zones. Our main methodological innovation is to use a survey of exchange rate forecasts, as well as interest differentials, in measuring exchange rate expectations. We investigate the hypothesis—suggested by the apparent stabilization of the EMS and by recent institutional developments—that the EMS target zones have experienced an increase in credibility since their 1987 realignment. The evidence tends to support this hypothesis for most currencies. We also examine the empirical failure of target zone models, but find no evidence that it can be attributed to mismeasurement of expectations. Finally, we consider an alternative credibility measure that captures the importance of possible realignments in overall expectations of exchange rate changes.

Optimal Investment Strategies for University Endowment Funds

Robert C. Merton

Working Paper No. 3820

August 1991

A common approach to the management of endowment is to treat it as if it were the only asset of the university. This leads to prescriptions for optimal investment and expenditure policies that are essentially the same across universities. Indeed, the resulting optimal portfolio strategies are focused almost exclusively on providing an efficient trade-off between risk and expected return, a generic objective that is just as applicable to individuals and nonacademic institutions as it is to universities.

In contrast, I develop a model that provides intertemporally optimal investment and expenditure rules

for endowment, taking account of the university's overall objectives and total resources. The explicit inclusion of other university assets in addition to endowment leads to optimal endowment portfolios that are not efficient in the sense of the risk-return trade-off. Moreover, two universities with similar objectives and endowments can have very different optimal portfolios and expenditure patterns if their nonendowment sources of cash flow are different. The model also takes account of the uncertainty surrounding the costs of the various activities that define the purpose of the university, such as education, research, and knowledge storage. As a result, the analysis reveals a perhaps somewhat latent role for endowment: namely, hedging against unanticipated changes in those costs.

Rules, Coordination, and Manipulability Among Arbitrators

Janet Currie

Working Paper No. 3821

August 1991

JEL No. J52

Using a panel of contracts between teachers and school boards in British Columbia, I show that the variance of arbitrated wage settlements is systematically lower than the variance of wage settlements negotiated without arbitration. This suggests that arbitrators coordinate their decisions. However, coordination on a rule leaves arbitrators as a group vulnerable to manipulation by coalitions of employers or employees who understand the rule. Because successful manipulation of arbitrators undermines the credibility of the institution, arbitrators as a group have incentives to change their rules from time to time. In British Columbia, school boards were more successful than teachers at manipulating arbitrators, and arbitrators indeed responded by changing their rule.

Optimal Law Enforcement with Self-Reporting of Behavior

Louis Kaplow and Steven Shavell

Working Paper No. 3822

August 1991

JEL Nos. K42, K40

Self-reporting—parties reporting their own behavior to an enforcement authority—is commonly observed in law enforcement and in environmental and safety regulation. We add self-reporting to the model of the control of harmful externalities through probabilistic law enforcement. We characterize optimal self-reporting schemes and show that they offer two advantages over schemes without self-reporting: 1) enforcement resources are saved, because individuals who report harmful acts need not be identified; and 2) risk is reduced, because individuals bear certain sanctions when they report their behavior, rather than face uncertain sanctions.

An Aggregate-Demand-Aggregate-Supply Analysis of Japanese Monetary Policy, 1973-90

Kenneth D. West

Working Paper No. 3823

August 1991

I use an aggregate-demand-aggregate-supply framework to analyze the effects of Japanese monetary policy from January 1973 to August 1990. I find that money supply shocks contribute relatively little to output variability over the sample as a whole. Nor do these shocks seem to be particularly marked during business cycle contractions. The effects of monetary policy on prices and output appear to be quite similar to those of a constant money growth rule.

Money, Output, and Prices: Evidence from a New Monetary Aggregate

John C. Driscoll, James M. Poterba,

and **Julio J. Rotemberg**

Working Paper No. 3824

August 1991

JEL Nos. E51, E52

This paper develops a new utility-based monetary aggregate that we name the currency-equivalent (CE) aggregate. This aggregate equals the stock of currency that would be required for households to obtain the same liquidity services that they get from their entire collection of monetary assets. We compare the ability to forecast real activity of the new aggregate with conventional aggregates, such as M1 and M2, and other indicators of monetary policy. The CE aggregate has more predictive power for output and prices than standard aggregates do, and the time path of the estimated output response is more consistent with broad classes of theoretical models.

Multinational Firms, Technology Diffusion, and Trade

Winifred J. Ethier and James R. Markusen

Working Paper No. 3825

August 1991

JEL Nos. F12, F23

There is a close association between multinational firms and knowledge capital: a "public good" within a firm. We model a firm that wants to exploit its knowledge capital abroad, but whose workers acquire all the knowledge necessary for production and can defect and produce the good themselves. The home firm then must choose between costly exporting and the possible dissipation of its knowledge capital by producing abroad.

We examine the choice among exporting, licensing, and acquiring a subsidiary in such an environment. We analyze the cost and technology parameters that support the alternative modes of serving the foreign market, and we describe the international equilibrium that jointly determines the pattern of specialization and the market mode.

How Much Has Deunionization Contributed to the Rise in Male Earnings Inequality?

Richard B. Freeman

Working Paper No. 3826

August 1991

This paper estimates the effect of changing union density on earnings differentials and inequality among male workers in the United States, and on earnings differentials among industries in the OECD countries.

For the United States, the evidence indicates that the fall in union density contributed to the 1980s' increase in earnings inequality. Cross-section-based estimates of union wage effects suggest that 40–50 percent of the rise in the white collar premium, 15–40 percent of the rise in the college premium, and 20 percent of the rise in (the standard deviation of \ln) earnings for all men are attributable to the fall in union density. Longitudinal-based estimates of union wage effects suggest that deunionization contributed less to the rise in differentials.

Still, the dispersion of earnings grew as much among organized workers as among otherwise comparable nonunion workers, so that overall dispersion would have risen substantially even if the entire work force had been organized. Deunionization thus was a factor in the rise in inequality but not *the* factor.

The cross-country comparisons show that earnings distributions are more compact among union workers than among nonunion workers in OECD countries with different union densities, types of union movements, and with very different union/nonunion wage differentials. Therefore, the relationship between unionism and dispersion is a general outcome of unionism, not something specific to U.S. institutions.

In addition, earnings differentials by industry are smaller and increased less in the 1980s in highly unionized countries than in less unionized countries. This suggests that strong national union movements can partially offset market pressures for rising inequality.

Skill Differentials in Canada in an Era of Rising Labor Market Inequality

Richard B. Freeman and Karen Needels

Working Paper No. 3827

September 1991

This paper examines earning differentials by education in Canada in the 1980s and compares changes in differentials to those in the United States. Our major finding is that the college/high school differential increased much less in Canada than in the United States. We also find that, within educational groups, the distribution of earnings widened, gender pay gaps narrowed, and age pay gaps increased in Canada and in the United States.

The greater the growth of the proportion of college graduates in the work force in Canada than in the United States is one important reason why differentials rose more modestly in the former. The greater strength of Canadian unions in wagesetting, and the faster growth of real national output, and a better trade balance in Canada also may have contributed to the smaller rise in differentials.

Because Canada and the United States have so many characteristics in common, we believe our results indicate that the massive rise of skill differentials in the United States was not the result of some inexorable shift in the economic structure of advanced capitalist countries, but rather reflected specific developments in the U.S. labor market and the way in which the country's decentralized wagesetting system adjusted to these developments.

Investment in Capital Assets and Economic Performance: The U.S. Chemicals and Primary Metals Industries in Transition

Catherine J. Morrison

Working Paper No. 3828

September 1991

JEL Nos. L60, D24, O47

The effects of market and technological conditions on the investment and markup behavior of firms, and their resulting impacts on economic performance, are closely interrelated and complex. This paper explores determinants of, and linkages among, these factors for two industries with very different performance records and development patterns over the past three decades: chemicals and primary metals. The analysis uses a production theory model that permits explicit assessment of the motivations underlying firm decisions, and Bureau of Labor Statistics data from 1955–86.

I distinguish general capital investments from investments in innovative or high tech capital, such as office and communications equipment and technical and scientific apparatus. I model investment behavior, and thus capacity utilization, explicitly as responses to adjustment costs for capital assets. This approach facilitates the measurement of technological and behavioral factors underlying investment, input demand, and pricing decisions. This in turn allows investment patterns and their determinants across capital assets to be interpreted, and their linkages with productive and financial performance to be identified.

What Ended the Great Depression?

Christina D. Romer

Working Paper No. 3829

September 1991

JEL Nos. E32, N12, E52

This paper examines the role of aggregate demand stimulus in ending the Great Depression. A simple calculation indicates that nearly all of the observed recovery of the U.S. economy prior to 1942 was caused by monetary expansion. Huge gold inflows in the mid- and late 1930s swelled the U.S. money stock and appear to have stimulated the economy by lowering real interest rates and encouraging investment spending and purchases of durable goods. The finding that monetary developments were crucial to the recovery implies that self-correction played little role in the growth of real output between 1933 and 1942.

Macroeconomic Policy and Elections in OECD Democracies

Alberto Alesina, Gerald D. Cohen, and Nouriel Roubini

Working Paper No. 3830

September 1991

JEL Nos. E32, E63

This paper tests for evidence of opportunistic "political business cycles" in a large sample of 18 OECD economies. Our results are: 1) there is very little evidence of pre-electoral effects of economic outcomes (in particular, on GDP growth and unemployment); 2) there is some evidence of "political monetary cycles," (expansionary monetary policy in election years); 3) there also are indications of "political budget cycles," or "loose" fiscal policy prior to elections; and 4) inflation exhibits a post-electoral jump, which could be explained either by the pre-electoral "loose" monetary and fiscal policies and/or by an opportunistic timing of increases in publicly controlled prices, or indirect taxes.

Alcohol Control Policies and Motor Vehicle Fatalities

Frank J. Chaloupka, Michael Grossman, and Henry Saffer

Working Paper No. 3831

September 1991

JEL Nos. I18, K42

This study estimates the effects of drunk driving deterrents and other alcohol-related policies on drunk driving. Our dataset is an annual time series of state cross sections for the 48 contiguous United States from 1982-8. We use total and alternative alcohol-involved motor vehicle fatality rates, for the general population and for 18-to-20-year olds, as measures of drunk driving.

The results indicate that the most effective policies are increased beer taxes and mandatory administrative license actions. Maintaining the beer tax at its real 1951 value would have reduced fatalities by 11.5 percent annually, on average, during the sample period. A mandatory administrative license sanction of one year would have reduced fatalities by 9 percent. The next most effective policies are a legal drinking age of 21, preliminary breath test and dram shop laws, and relatively large mandatory fines. These policies each reduce total fatalities by about 5-6 percent. Prohibitions on plea bargaining and mandatory license sanctions upon conviction also have some deterrent effect. Other drunk driving laws tested include mandatory jail sentences and community service options, illegal per se laws, and open container laws. None of these has a deterrent effect on drunk driving.

Does Participation in Transfer Programs During Pregnancy Improve Birthweight?

Nancy Cole and Janet Currie

Working Paper No. 3832

September 1991

JEL Nos. I12, I38, H53

A primary goal of transfer programs to the non-aged, nondisabled poor in the United States is to improve the

well-being of children. Thus it is surprising that most of the considerable research devoted to the study of transfer program has focused on the incentive effects of the programs for parents rather than on the question of whether parental participation in such programs measurably benefits children. This paper begins to fill this gap in the literature by examining the relationship between a mother's participation during pregnancy in Aid to Families with Dependent Children, the Food Stamp Program, or housing assistance, and one of the least controversial measures of child welfare: birthweight.

We do not find any statistically significant relationship between a mother's participation in these programs during pregnancy and the birthweight of her child. However, birthweight is only one measure of child welfare and these entitlement programs may well have positive impacts on the health and development of children once they are born.

The Informativeness of Prices: Search with Learning and Cost Uncertainty

Roland Bénabou and Robert Gertner

Working Paper No. 3833

September 1991

JEL Nos. D80, E31

Aggregate cost uncertainty, which can arise from real shocks or unanticipated inflation, reduces the informativeness of prices by scrambling relative and aggregate variations. But when agents can acquire additional information, increased noise in fact may lead them to be better informed. Then price competition will intensify.

We examine these issues in a model of search with learning: consumers search optimally from an unknown price distribution, while firms price optimally given consumers' search rules. We show that the decisive factor in whether the variability of inflation increases or decreases the incentive to search, and thereby market efficiency, is the information costs.

Risk Sharing, Altruism, and the Factor Structure of Consumption

Joseph G. Altonji, Fumio Hayashi,

and Laurence J. Kotlikoff

Working Paper No. 3834

September 1991

JEL No. D12

We consider four models of consumption that differ with respect to efficient risk sharing and altruism. They range from complete markets with altruism to family risk sharing. We use a matched sample of parents and independent children from the Panel Study of Income Dynamics to discriminate among the four models. Our testing procedure is designed to deal with the set of observed independent children being selected endogenously. We can reject decisively the combined hypothesis of complete markets and altruism, but we cannot reject altruism, and hence family risk sharing, for a subset of families.

Do Tax-Exempt Bonds Really Subsidize Municipal Capital?

Roger H. Gordon and Gilbert E. Metcalf

Working Paper No. 3835

September 1991

JEL Nos. H7, H71, H74

We argue that the tax-exempt status of municipal bonds provides little or no subsidy to capital investment by communities. Instead, the tax exemption simply provides arbitrage opportunities to individuals in high and low tax brackets, while leaving individuals in intermediate tax brackets essentially unaffected.

We also argue that the revenue cost of the tax exemption is much less than traditionally thought because of the portfolio rebalancing that would occur if the tax exemption were eliminated. Finally, we note that the only way to prevent all municipal arbitrage possibilities would be to pass through municipal interest income and payments to residents for tax purposes.

Measuring Depreciation for Japan: Rejoinder to Dekle and Summers

Fumio Hayashi

Working Paper No. 3836

September 1991

JEL Nos. C82, E2

Recently, Dekle and Summers (NBER Working Paper No. 3690, April 1991) challenged my claim that depreciation reported in the Japanese national accounts is underestimated by a substantial margin. They argue that the implied depreciation rate (the ratio of depreciation to the capital stock) is implausibly high.

In this rejoinder, I argue that Japan's high depreciation rate can be attributed to two factors. First, the depreciation rate for owner-occupied housing is much higher in Japan than in the United States. Second, equipment capital (a component of the denominator in the depreciation rate) in the Japanese national accounts seems to be underestimated. Therefore, my estimate of the level of depreciation for Japan does not appear exaggerated.

Education and the Unemployment of Women

Jacob A. Mincer

Working Paper No. 3837

September 1991

JEL Nos. I20, J6, J16

The more education they have, the less unemployment there is among women. This relationship is as strong among women as among men. The channel through which this relationship arises also is the same for both sexes: it is labor turnover, almost half of which involves unemployment. However, among men, the relationship between education and turnover is mediated largely by differences in on-the-job training, while among women, differences in labor force attachment are the main source of differences in turnover. This is because levels of educational differences caused by on-the-job (or in-house) training are small among

women, while nonparticipation and educational differences in the labor market are quite small among men. Differences in the duration of unemployment related to education are negligible among women, although they are observable but small among men.

Recent growth in women's attachment to work has reduced their turnover within the labor force and their unemployment rate to the point of eliminating the sex differential. On-the-job training of women appears to have increased, although it still remains skimpy.

Education and Unemployment

Jacob A. Mincer

Working Paper No. 3838

September 1991

JEL Nos. I20, J6

One major benefit of education is that there is a lower risk of unemployment at higher educational levels. In data on the male labor force from the Panel Study of Income Dynamics, it appears that the reduction of the *incidence* of unemployment is far more important than the reduced *duration* of unemployment in creating educational differentials in unemployment rates. In turn, the lower incidence of unemployment among more educated workers is about equally attributable to their greater attachment to the firms employing them and to their lower risk of becoming unemployed when they do separate from the firm.

The lower frequency of job turnover among more educated workers, which creates fewer episodes of unemployment for them, is attributable in large part to more on-the-job training.

In explaining why educated workers experience less conditional unemployment, and unemployment of somewhat shorter duration, I provide indirect evidence that: 1) costs of on-the-job search for new employment relative to costs of searching while unemployed are lower for more educated workers; 2) these workers also are more efficient in acquiring and processing job search information; and 3) firms and workers search more intensively to fill vacancies for more skilled employees.

Tax Exporting, Federal Deductibility, and State Tax Structure

Gilbert E. Metcalf

Working Paper No. 3839

September 1991

JEL No. H7

In this paper, I study the interaction between the federal and state tax systems during the 1990s. In particular, I consider how the Tax Reform Act of 1986 affected state tax structures.

Using a panel dataset on state governments over a nine-year period, I estimate tax share equations for six categories of taxes. I find that the state personal income tax is sensitive to changes in its tax price. The general sales tax is much less sensitive to changes in tax prices. Then I consider various reasons why the sales tax does not exhibit a sensitivity to changes in tax price, and consider the implications of my results for policymakers.

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