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Program Report

International Studies

William H. Branson

Since my last program report (*NBER Reporter*, Spring 1987), the focus of attention in international economics has remained on competitiveness and protection; macroeconomic policy coordination; debt and stabilization in developing countries; and international financial markets. There also has been a resurgence of interest in growth and its interaction with trade, and the emergence of the single European market of 1992 has provided a new set of questions for researchers.

This report will discuss the program's research in six main areas: trade and competitiveness; strategic behavior and trade; international macroeconomics; international finance; developing country debt; and stabilization programs in developing countries. The report ends with a discussion of the NBER project on international taxation and the series of international seminars sponsored jointly by the NBER and other organizations.

Trade and Competitiveness

Analyses of U.S. trade and competitiveness, and of adjustment of U.S. trade to changes in the pattern of world trade and competitive pressure from abroad, have long been a central part of our research. Current work includes studies of growth and trade with differentiated products; hysteresis in trade fluctuations; the role of multinational corporations in trade; growth of trade in services; trade and fluctuations in stock prices; competitiveness and differences in the cost of capital; and the effects of trade policy.

Gene M. Grossman and Elhanan Helpman have been studying the effect of the international economic environment, including trade policy, on innovation and

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This issue of the *Reporter* highlights the Bureau's Program in International Studies. Next, Takatoshi Ito describes his work on exchange rates. Then, Randall Mörck, Andrei Shleifer, and Robert W. Vishny report on their study of the conflict between managers and shareholders. After the quarterly Economic Outlook Survey are biographical sketches, news of NBER conferences, the Conference Calendar, and other NBER news and reports. The *Reporter* concludes with short summaries of recent NBER Working Papers.

growth.¹ One of their results is that trade can make available a wider range of inputs and technologies, and thus can increase the growth rate. Nancy P. Marion also has developed a model in which the growth rate is endogenous, with learning by doing. In her model, open capital markets do not necessarily increase the growth rates; the nation's knowledge-based growth rate actually could fall.²

¹G. M. Grossman and E. Helpman, "Product Development and International Trade," *NBER Working Paper No. 2540*, March 1988, and "Growth and Welfare in a Small Open Economy," *NBER Working Paper No. 2970*, May 1989.

²M. Kohn and N. P. Marion, "The Implications of Knowledge-Based Growth for the Optimality of Open Capital Markets," *NBER Working Paper No. 2487*, January 1988.

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In a related area, Richard E. Baldwin, one of the pioneers in the analysis of hysteresis in U.S. trade, has been working with Richard Lyons.³ With hysteresis, foreign firms enter the U.S. market as the dollar appreciates but do not exit when the dollar comes back down to the level at which they entered. The exit price is lower than the entry price. This is one explanation of why U.S. imports remained high as the dollar depreciated after 1987.

Robert E. Lipsey, Rachel McCulloch, Irving B. Kravis, and Magnus Blomström have continued their work on multinational corporations and international investment. Kravis and Lipsey also are studying the determinants of price level differences across countries. Kravis and Lipsey have found that exports of manufactured goods by U.S. multinationals have retained their share of world exports in the 1980s, while the share of the United States in world exports has declined.⁴ Blomström finds that multinationals increase competition in the host country.⁵ McCulloch is now studying the effects of inward foreign investment in the United States.⁶

Albert Ando, Jorge Braga de Macedo, and I are studying international comparisons of the cost of capital. In a comparative study of saving and investment in the United States and Japan, Ando has estimated their relative costs of capital.⁷ In a joint research project with J. David Richardson, de Macedo and I are estimating real effective exchange rates, inclusive of relative costs of capital. Our study of the effects of exchange rate changes across countries will follow the lines of my recent work with James H. Love.⁸ Related research on the effects of changes in exchange rates or trade policies on relative stock prices of sectors producing traded goods has been done by Grossman and James A. Lev-

³Richard E. Baldwin, "Some Empirical Evidence on Hysteresis in Aggregate U.S. Import Prices," *NBER Working Paper No. 2483, January 1988*; and Richard E. Baldwin and R. Lyons, "Exchange Rate Hysteresis: The Real Effects of Large versus Small Policy Misalignments," *NBER Working Paper No. 2828, January 1989*.

⁴I. B. Kravis and R. E. Lipsey, "Technological Characteristics of Industry and the Competitiveness of the United States and Its Multinationals," *NBER Working Paper No. 2933, April 1989*.

⁵M. Blomström, "Efficiency Differences between Foreign and Domestic Firms in Mexico," *World Development (November 1988)*.

⁶R. McCulloch, "Japanese Investment in the United States," in *The Internationalization of U.S. Markets, D. Audretsch and M. Claudon, eds. New York: New York University Press, forthcoming*.

⁷A. Ando and A. J. Auerbach, "The Corporate Cost of Capital in Japan and the United States: A Comparison," *NBER Reprint No. 1213, June 1989*; in *Journal of Japanese and International Economics (1988)*, pp. 134-158; and in *Government Policy Towards Industry in the United States and Japan, J. B. Shoven, ed. New York: Cambridge University Press, pp. 21-49*.

⁸W. H. Branson and J. H. Love, "The Real Exchange Rate, Employment, and Output in Manufacturing in the United States and Japan," *NBER Working Paper No. 2491, January 1988*.

insohn, and by James A. Brander. These studies find that stock prices *do* react to trade news.⁹

Barry J. Eichengreen and Lawrence H. Goulder have developed a dynamic computable general equilibrium (CGE) model to study the changing international competitive position of the U.S. economy. They have used it to study the effects of changes in domestic taxation designed to promote saving and investment on export-producing sectors, and to compare the effects of tariffs versus voluntary export restrictions (VERs). With a high degree of international capital mobility, subsidizing saving helps exports in the short run, but not in the long run. The opposite is true for subsidizing investment. Also, VERs do more damage to the economy than tariffs do. In April 1988, Robert C. Feenstra organized a conference on "Trade Policies for International Competitiveness" (summarized in the *NBER Reporter*, Summer 1988).¹⁰

Robert E. Baldwin continues to head the project on American trade relations; he and Richardson edited a Conference Report, *Issues in the Uruguay Round*, in 1988.

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 1983. More recently, Paul R. Krugman, and Alasdair Smith of the Center for Economic Policy Research (CEPR) in London have been leading a group of researchers who are conducting empirical case studies of strategic behavior and trade at the industry level. A report on their October conference will appear in the Winter 1989/90 issue of the *NBER Reporter*. Several NBER researchers made important early contributions in this area. Helpman and Krugman have written a concise exposition of this topic, with extensive references.¹¹

In addition, Barbara J. Spencer has been working on the trade policy implications of domestic dependence on imports for the supply of a key intermediate input, examining incentives for the exporting firm and the

government to restrict exports of the input.¹² Carl Shapiro has been working on the related problem of the costs of switching between sources of supply, and horizontal mergers.¹³

Feenstra, Kala Krishna, Robert W. Staiger, and Richard H. Clarida also continue to work in this area. Feenstra and Krishna have analyzed the consequence of auctioning import quota rights. Feenstra argues that giving any quota rents to foreign suppliers will remove an incentive for domestic producers to appeal for protection. Krishna argues that foreign producers will appropriate the quota rent by their price reactions, anyway.¹⁴

Staiger is working on the determinants of the equilibrium level of protection in a framework that recognizes that trade volumes fluctuate, so that all parties are tempted to protect when import volumes surge. He interprets the General Agreement on Tariffs and Trade (GATT) as a forum for countries to coordinate their policies to achieve the most cooperative self-enforcing equilibrium low levels of protection.¹⁵ Clarida has been working on the interaction between learning by doing and trade policy.

On the empirical side, Richard C. Marston and I have studied the responses of price and output by Japanese manufacturing firms when the real exchange rate changes. We present evidence that Japanese firms "price to market," varying their export prices in yen relative to their domestic prices and absorbing the exchange rate fluctuations in profit margins. This may be one reason why U.S. import prices respond slowly to exchange rate changes.¹⁶

Several researchers have examined the political economy of trade policy. Research Associate Marie C. Thursby has been working on rules versus discretion in trade policy when governments have private information about political pressure at home. If the government needs to establish its reputation as a trade policymaker,

⁹G. M. Grossman and J. A. Levinsohn, "Import Competition and the Stock Market Return to Capital," *NBER Working Paper No. 2421*, October 1987; and J. A. Brander, "Election Polls, Free Trade, and the Stock Market: Evidence from the 1988 Canadian General Election," *NBER Working Paper No. 3073*, August 1989.

¹⁰B. J. Eichengreen and L. H. Goulder, "Savings Promotion, Investment Promotion, and International Competitiveness," *NBER Working Paper No. 2635*, June 1988, and in *Trade Policies for International Competitiveness*, R. C. Feenstra, ed. Chicago: University of Chicago Press, 1989; and "Trade Liberalization in General Equilibrium: Intertemporal and Interindustry Effects," *NBER Working Paper No. 2965*, May 1989.

¹¹E. Helpman and P. R. Krugman, *Trade Policy and Market Structure*. Cambridge, MA: MIT Press, 1989.

¹²B. J. Spencer and R. W. Jones, "Vertical Foreclosures and International Trade Policy," *NBER Working Paper No. 2920*, April 1989, and "Trade and Protection in Vertically Related Markets," *NBER Working Paper No. 3023*, June 1989.

¹³C. Shapiro, "Dynamic Competition with Switching Costs," *Rand Journal of Economics (Spring 1988)*.

¹⁴K. Krishna, "The Case of the Vanishing Revenues: Auction Quotas with Oligopoly," *NBER Working Paper No. 2723*, September 1988, and "The Case of the Vanishing Revenues: Auction Quotas with Monopoly," *NBER Working Paper No. 2840*, February 1989; and R. C. Feenstra, "Auctioning U.S. Import Quotas, Foreign Response, and Alternative Policies," *NBER Working Paper No. 2839*, February 1989.

¹⁵K. Bagwell and R. W. Staiger, "A Theory of Managed Trade," *NBER Working Paper No. 2756*, November 1988.

¹⁶W. H. Branson and R. C. Marston, "Price and Output Adjustment in Japanese Manufacturing," *NBER Working Paper No. 2878*, March 1989; and R. C. Marston, "Pricing to Market in Japanese Manufacturing," *NBER Working Paper No. 2905*, March 1989.

then discretion may dominate rules. Anne O. Krueger has found that the biases inherent in political decision-making imply that government intervention is likely to be more pervasive in import-competing industries than in exportables.¹⁷

Robert Baldwin has collected papers on the political economy of trade policy.¹⁸ Richardson has surveyed the research on the effects of trade policy with imperfect competition.¹⁹ These, plus the Helpman-Krugman book, provide a good summary of the program's work on strategic behavior and trade.

International Macroeconomics

Within international macroeconomics, the most active research areas have been analyses of aspects of fiscal policy and public debt, and international cooperation with some emphasis on the European Monetary System. In the fiscal area, Jacob A. Frenkel—on leave as Economic Counsellor and Director of Research at the International Monetary Fund (IMF)—and Assaf Razin have completed a major project on the role of fiscal policies in the world economy. (The project produced several working papers and a book.) They show how the composition of spending, taxing, and borrowing will have differential effects between countries and over time.²⁰

Willem H. Buiter also has studied the conditions under which the choice between tax and debt financing of spending matters.²¹ John F. Helliwell and Vittorio U. Grilli, among others, study the effects of fiscal policies on exchange rates and international imbalances.²² Nouriel Roubini has studied the determinants of the level of spending and deficits, and rejects the tax-smoothing model in favor of political determinants.²³

¹⁷R. Jensen and M. C. Thursby, "Tariffs with Private Information and Reputation," NBER Working Paper No. 2959, May 1989; and A. O. Krueger, "Asymmetries in Policy between Exportables and Import-Competing Goods," NBER Working Paper No. 2904, March 1989.

¹⁸Robert E. Baldwin, ed., *Trade Policy Issues and Empirical Analysis*. Chicago: University of Chicago Press, 1988.

¹⁹J. D. Richardson, "Empirical Research on Trade Liberalization with Imperfect Competition: A Survey," NBER Working Paper No. 2883, March 1989, and in *OECD Economic Studies* 12 (Spring 1989), pp. 7-50.

²⁰J. A. Frenkel and A. Razin, *Fiscal Policies and the World Economy*. Cambridge, MA: MIT Press, 1987.

²¹W. H. Buiter, "Debt Neutrality, Professor Vickrey, and Henry George's 'Single Tax,'" NBER Reprint No. 1211, June 1989.

²²J. F. Helliwell, "The Effects of Fiscal Policy on International Imbalances: Japan and the United States," NBER Working Paper No. 2660, July 1988; and V. U. Grilli, "Fiscal Policies and the Dollar/Pound Exchange Rate, 1870-1984," NBER Working Paper No. 2482, January 1988.

²³N. Roubini and J. D. Sachs, "Government Spending and Budget Deficits in the Industrial Economies," NBER Working Paper No. 2919, April 1989.

Francesco Giavazzi finds that a longer average maturity of the public debt contributes to the sustainability of fixed exchange rates with free capital mobility.²⁴

Koichi Hamada wrote on international coordination in the 1970s and has continued his work on the topic. Paul R. Masson was one of the builders of the IMF's Multimod, a world simulation model that is used to make projections for the IMF's semiannual *World Economic Outlook*. He has continued his simulation studies of coordination using the model, along with Jacob A. Frenkel and other IMF colleagues.²⁵ Jeffrey A. Frankel has focused on the obstacles to international macroeconomic policy coordination, including disagreement among policymakers on the true model of the economy, the current state of the economy, and policy objectives. A recent Frankel paper analyzes the case for international targeting of nominal GNP.²⁶

Frenkel has written several papers on aspects of cooperation. In the fall of 1988, Frenkel, Morris Goldstein, and I organized a conference on "International Policy Coordination and Exchange Rate Fluctuations." Earlier, in the spring of 1987, Martin Feldstein organized a conference on "International Economic Cooperation."²⁷ One general conclusion from the papers in these two conference volumes, and from the entire line of research in the area, seems to be that the gains from macroeconomic policy coordination, narrowly defined, are likely to be small, but the gains from cooperation, more broadly defined, may be significant.

Susan M. Collins, currently on leave at the Council of Economic Advisers, studied the effects of the formation of the European Monetary System (EMS) on inflation in Europe. She questioned the widely held view that the EMS contributed significantly to the reduction of inflation.²⁸ Alessandra Casella is studying the optimal design of a European central bank and the constraints that a common European currency would place on national fiscal policies.²⁹ Francesco Giavazzi and Alberto Giovannini have written a book on the operation and effects of the EMS.³⁰

²⁴F. Giavazzi and M. Pagano, "Confidence Crises and Public Debt Management," NBER Working Paper No. 2926, April 1989.

²⁵J. A. Frenkel, M. Goldstein, and P. R. Masson, "International Coordination of Economic Policies: Scope, Methods, and Effects," NBER Working Paper No. 2670, July 1988.

²⁶J. A. Frankel, "A Modest Proposal for International Nominal Targeting (INT)," NBER Working Paper No. 2849, February 1989.

²⁷M. Feldstein, ed., *International Economic Cooperation*. Chicago: University of Chicago Press, 1988.

²⁸S. M. Collins, "Inflation and the EMS," NBER Working Paper No. 2599, May 1988.

²⁹A. Casella and J. Feinstein, "Management of a Common Currency," NBER Working Paper No. 2740, October 1988.

³⁰F. Giavazzi and A. Giovannini, *Limited Exchange Rate Flexibility*. Cambridge, MA: MIT Press, 1989.

Other lines of research in international macroeconomics do not fit into the fiscal and cooperation themes. Robert P. Flood and Marion continue their work on two-tier exchange markets, finding empirically that domestic policy variables have little influence on the spread between the two rates. Carol Osler shows how real disturbances are transmitted internationally and intertemporally via the terms of trade. Alan C. Stockman studies the effect of the choice of a nominal exchange rate regime on real exchange rate variability.³¹

International Finance

Robert J. Hodrick, Lars E. O. Svensson, Takatoshi Ito, and Karen K. Lewis have continued the program's work in international asset pricing and exchange rate determination. Hodrick examines how changes in the degree of uncertainty about the economic environment or policy affect not only the variance of asset prices but also their levels. Svensson has shown how uncertainty about monetary policy affects asset substitutability and has studied optimal portfolio allocation when some assets are traded internationally. Ito has estimated the impact of news on exchange markets as trading opens and closes around the world daily. He also has analyzed the role of news versus noise in dollar/yen trading. Lewis has evaluated the behavior of exchange rates and asset prices when the process driving their fundamental determinants changes.³²

Frankel, Charles M. Engel, Kenneth A. Froot, and Grilli have considered market efficiency and excess volatility in exchange rates. Their work suggests that exchange rates overreact to news; that is, that the market is excessively volatile.³³ Linda Goldberg is working on the effects of exchange rate volatility on investment in the United States. She finds that in the 1980s, increased

exchange rate volatility reduced investment.³⁴ Richard M. Levich has studied innovation in financial markets, the pressure for harmonization in European financial markets from the 1992 unification provisions, and hedging techniques in the Euromarkets.³⁵

A number of NBER researchers have been working on problems of trigger pricing, exchange rate bands, and hysteresis, mentioned earlier with respect to trade. These problems generally involve "smooth pasting" conditions, in which asset prices approach limits smoothly. One example is the behavior of exchange rates within a target zone, analyzed in an early contribution by Krugman.³⁶ These problems also involve a return for waiting, so that options pricing models are relevant for their analysis. Bernard Dumas analyzed the behavior of the real exchange rate when it is costly to transfer assets internationally.³⁷ Krugman and Dumas have continued to work in this area, along with Flood, Froot, and Maurice Obstfeld.³⁸

Developing-Country Debt

The debt problems of the developing countries and their partners, the lending banks, became an important research focus, and an international public policy issue in the 1980s. Jeffrey D. Sachs headed a major project on this topic that has produced four volumes on debt issues.³⁹ This project examined the causes and consequences of the debt crisis in Argentina, Bolivia, Brazil, Mexico, Indonesia, Korea, the Philippines, and Turkey. It also included studies of earlier debt crises,

³⁴L. Goldberg, "Nominal Exchange Rate Patterns: Effects on Entry, Exit, and Investment in U.S. Industry," forthcoming as an NBER Working Paper.

³⁵R. M. Levich, "The Euromarkets After 1992," NBER Working Paper No. 3003, June 1989; and A. Koh and R. M. Levich, "Synthetic Euro-currency Interest Rate Futures Contracts: Theory and Evidence," NBER Working Paper No. 3055, August 1989.

³⁶P. R. Krugman, "Trigger Strategies and Price Dynamics in Equity and Foreign Exchange Markets," NBER Working Paper No. 2459, December 1987.

³⁷B. Dumas, "Pricing Physical Assets Internationally," NBER Working Paper No. 2569, April 1988.

³⁸R. P. Flood and P. M. Garber, "The Linkage between Speculative Attack and Target Zone Models of Exchange Rates," NBER Working Paper No. 2918, April 1989; K. A. Froot and M. Obstfeld, "Exchange Rate Dynamics under Stochastic Regime Shifts: A Unified Approach," NBER Working Paper No. 2835, February 1989; B. Dumas, "Super Contact and Related Optimality Conditions: A Supplement to Avinash Dixit's 'A Simplified Exposition of Some Results Concerning Regulated Brownian Movement,'" NBER Technical Working Paper No. 77, April 1989; and P. R. Krugman, "Target Zones with Limited Reserves," forthcoming as an NBER Working Paper.

³⁹J. D. Sachs, ed., *Developing Country Debt and the World Economy, 1988*; *Developing Country Debt and Economic Performance, Volume 1: The International Financial System, 1988*; *Volume 2: Country Studies—Argentina, Bolivia, Brazil, Mexico, 1989*; and *Volume 3: Country Studies—Indonesia, Korea, the Philippines, Turkey, 1989*; all published by the University of Chicago Press.

³¹R. P. Flood and N. P. Marion, "Risk Neutrality and the Two-Tier Foreign Exchange Market: Evidence from Belgium," NBER Working Paper No. 3015, June 1989; C. Osler, "Terms of Trade and the Transmission of Output Shocks in a Rational Expectations Model," NBER Working Paper No. 2681, August 1988; and A. C. Stockman, "Real Exchange Rate Variability under Pegged and Floating Nominal Exchange Rate Systems: An Equilibrium Theory," NBER Working Paper No. 2565, April 1988.

³²R. J. Hodrick, "Risk Uncertainty and Exchange Rates," NBER Working Paper No. 2429, November 1987; L. E. O. Svensson, "Portfolio Choice and Asset Pricing with Nontraded Assets," NBER Working Paper No. 2774, November 1988; T. Ito and V. V. Roley, "Intraday Yen/Dollar Exchange Rate Movements: News or Noise?" NBER Working Paper No. 2703, September 1988; and K. K. Lewis, "On Occasional Monetary Policy Coordinations That Fix the Exchange Rate," *Journal of International Economics* 26, 1/2 (1989), pp. 139-156.

³³K. A. Froot, "Tests of Excess Forecast Volatility in the Foreign Exchange and Stock Markets," NBER Working Paper No. 2362, August 1987; C. M. Engel, J. A. Frankel, K. A. Froot, and A. Rodriguez, "Conditional Mean-Variance Efficiency of the U.S. Stock Market," NBER Working Paper No. 2890, March 1989; and V. U. Grilli, "Financial Integration, Liquidity, and Exchange Rates," NBER Working Paper No. 3088, August 1989.

structural adjustment policies in debtor countries and the role of the IMF, growth in industrial economies, and domestic political factors in debt crises.

The potential for default, or the ability to force renegotiations, makes the borrowing and repaying process a strategic interaction between the banks and the borrower. The interaction may be complicated by asymmetries of information between the two sides. In a series of papers, Raquel Fernandez has analyzed this strategic process and the conditions under which a country has the incentive to continue payment. Jonathan Eaton has studied conditions under which the threat by the lender to impose sanctions is credible. Joshua Aizenman has studied country risk and strategic investment, in which investment in trade-dependent sectors may increase the country's incentives to repay.⁴⁰

The possibility of an increase in future taxes to service debt can create a disincentive to invest in the debtor country. This creates a "debt overhang," and the possibility that debt relief may be a positive-sum game, by removing this disincentive. NBER researchers have analyzed various techniques for such debt relief. Froot, Krugman, and Helpman analyze cases in which it may pay a country to buy back debt or in which the banks may gain by forgiving a fraction of debt.⁴¹ Sachs has argued that debt repurchases may benefit the debtor country in some situations; Jeremy I. Bulow and Kenneth Rogoff have emphasized other situations in which buybacks will not benefit debtors.⁴² Eichengreen and Richard Portes also have continued to study debt crises during the 1930s and earlier.⁴³

Stabilization in Developing Countries

Rudiger Dornbusch and Sebastian Edwards have studied the determinants of the outcomes of stabilization and structural adjustment, including credibility aspects. Dornbusch identified the stages from expan-

sion to collapse in programs that have failed, the role of the financial sector in adjustment, and the role of credibility in determining why countries wait before stabilizing. Edwards studied the role of openness in determining the outcome of an adjustment program.⁴⁴

Credibility has been one focus for Michael Bruno, on leave as governor of the Bank of Israel, and Dani Rodrik. Bruno has evaluated the use of econometrics in the design of credible macroeconomic stabilization programs. Rodrik emphasizes the links between trade and macroeconomics. He finds that, in some circumstances, policymakers must use overkill to establish a reputation as credible reformers. Rodrik's recent work focuses on the effects of uncertainty about policy on investment.⁴⁵

Other work on stabilization and structural adjustment includes research by Robert E. Cumby and Sweder J. G. van Wijnbergen on the effect of capital flight in undermining a stabilization program, and by myself and colleagues on the effect of stabilization and structural adjustment programs on income distribution.⁴⁶

Other Projects

In addition to the research and meetings described above, Krugman is leading a research group on U.S./Japan economic relations. The Winter 1989/90 issue of the *NBER Reporter* will summarize the results of their October meeting. Marston headed a group that examined the misalignment of the dollar.⁴⁷ Razin and Joel B. Slemrod, from the Bureau's Program in Taxation, jointly organized a project on the international aspects of taxation. The project culminated in a conference in February 1989 (described in the Spring 1989 *Reporter*). A conference volume is forthcoming.

Each year since 1979, the international studies program has held an intensive series of workshops and seminars in Cambridge over three weeks in August as part of the NBER's Summer Institute. This provides an especially important opportunity for the international studies group to gather, because its members are quite

⁴⁰R. Fernandez and R. W. Rosenthal, "Sovereign-Debt Renegotiations Revisited," NBER Working Paper No. 2981, May 1989; J. Eaton, "Monopoly Wealth and International Debt," NBER Reprint No. 1186, May 1989, and in *International Economic Review* 30, 1 (February 1989), pp. 33-48; and J. Aizenman, "Inward versus Outward Growth Orientation on the Presence of Country Risk," NBER Working Paper No. 2868, February 1989.

⁴¹K. A. Froot, "Buybacks, Exit Bonds, and the Optimality of Debt and Liquidity Relief," NBER Reprint No. 1166, April 1989, and in *International Economic Review* 30, 1 (February 1989), pp. 49-70; P. R. Krugman, "Financing versus Forgiving a Debt Overhang," NBER Working Paper No. 2486, January 1988; and E. Helpman, "Voluntary Debt Reduction: Incentives and Welfare," NBER Working Paper No. 2692, August 1988.

⁴²J. D. Sachs, "Conditionality, Debt Relief, and the Developing Country Debt Crisis," NBER Working Paper No. 2644, July 1988; and J. I. Bulow and K. Rogoff, "Sovereign Debt Repurchases: No Cure for Overhang," NBER Working Paper No. 2850, February 1989.

⁴³B. J. Eichengreen and R. Portes, "Dealing with Debt: The 1930s and the 1980s," NBER Working Paper No. 2867, February 1989.

⁴⁴R. Dornbusch, "Notes on Credibility and Stabilization," NBER Working Paper No. 2790, December 1988; R. Dornbusch and A. Reynoso, "Financial Factors in Economic Development," NBER Working Paper No. 2889, March 1989; and S. Edwards, "Openness, Outward Orientation, Trade Liberalization, and Economic Performance in Developing Countries," NBER Working Paper No. 2908, March 1989.

⁴⁵M. Bruno, "Econometrics and the Design of Economic Reform," NBER Working Paper No. 2178, September 1988; and D. Rodrik, "Promises, Promises: Credible Policy Reform via Signaling," NBER Working Paper No. 2600, May 1988, and "Policy Uncertainty and Private Investment in Developing Countries," NBER Working Paper No. 2999, June 1989.

⁴⁶R. E. Cumby and S. J. G. van Wijnbergen, "Financial Policy and Speculative Runs with a Crawling Peg: Argentina, 1979-1981," NBER Working Paper No. 2376, September 1987; and F. Bourguignon, W. H. Branson, and J. de Melo, "Adjustment and Income Distribution: A Counterfactual Analysis," NBER Working Paper No. 2943, April 1989.

⁴⁷R. C. Marston, ed., *Misalignment of Exchange Rates: Effects on Trade and Industry*. Chicago: University of Chicago Press, 1988.

dispersed geographically, with many in Europe, Israel, and Japan. Since 1987, Marston has organized the macroeconomics and finance sessions of the Summer Institute, joined in 1989 by Froot. Richardson has continued to organize the trade sessions, joined in 1987 by Feenstra, in 1988 by Grossman, and in 1989 by Staiger.

Since 1987, three new international seminars, jointly or wholly sponsored by the NBER, have begun. The InterAmerican Seminar on Economics (IASE) is jointly sponsored by the Pontificia Universidade Catolica do Rio de Janeiro (PUC) and NBER, and meets annually in Latin America. It is organized by Edwards, and Edmar Bacha of PUC. Its papers appear in English in the *Journal of Development Economics* and in Spanish in *El Trimestre Económico*.

The International Seminar on International Trade (ISIT) is sponsored jointly with CEPR and meets biannually in the United States or Europe. It is organized by Robert Baldwin and Alan Winters. Its papers appear in *Weltwirtschaftliches Archiv*.

Finally, the East Asian Seminar on Economics (EASE), which will have its first meeting in Korea in 1990, is organized by Anne Krueger. The model for these seminars is the annual International Seminar on Macroeconomics (ISOM), sponsored jointly by the NBER and the Ecole des Hautes Etudes en Sciences Sociales (EHESS) in Paris and, since 1988, by the European Economic Association (EEA). The ISOM is organized by Robert J. Gordon of the NBER and Georges de Ménéil of EHESS and meets each June in Europe. Its papers are published in the *European Economic Review*, now the journal of the EEA, in the May issue following the meeting.

An exceptional meeting, sponsored by the Foundation for Advanced Information and Research (FAIR), Japan, was held in Tokyo in 1988.

Research Summaries

Exchange Rates

Takatoshi Ito

Since the Plaza Agreement of September 1985, the exchange rates of the major industrial countries have changed dramatically. The dollar depreciated against the yen and the mark by more than 60 percent in the six months following the Plaza Agreement. The dollar's

decline continued, although at a slower pace, throughout 1986 and 1987. In 1988, fluctuations in exchange rates decreased significantly but 1989 has been another volatile year.

What kinds of information can trigger large changes in the exchange rate? Why is the volatility apparently clustered in particular periods? How do expectations among traders change when there are large movements in exchange rates, and do their expectations affect the path of the exchange rate? To help answer these questions about exchange rate dynamics, researchers turn to both intradaily data and survey data on exchange rate expectations.

Intradaily Exchange Rate Dynamics: News Announcements, 1980-5

If the foreign exchange market is "efficient," then any movement of the exchange rate should reflect the arrival of new information or "news." For example, an announcement of an unexpected increase in the money supply should affect the exchange rate. In my research, I considered how exchange rates responded to important news about money supply, inflation, and industrial production. Working backward, I also recorded the days (and hours) when large changes in the exchange rate occurred, and then tried to identify the news behind these large jumps.

Because of the time difference between Japan and the United States, the hours of the Tokyo and New York foreign exchange markets do not overlap. Thus, it is possible to distinguish exchange rate movements caused by Tokyo news from those caused by New York news. V. Vance Roley and I exploit this idea by examining the responses of the exchange rate to announcements of the money supply, the inflation rate, and the industrial production index in the United States and Japan.¹ If the market is efficient, there should be a response within minutes after an announcement. We show that when the Federal Reserve pursued a money supply target, from October 1979 to October 1982, the U.S. money supply announcement had a significant effect on the exchange rate. Unexpected increases in the money supply created an expectation that the money supply would be curtailed in the coming months, so that the interest rate, and consequently the dollar, would have to rise. Even after the New York market closed, the exchange rate responded to the money supply announcement, suggesting that it took not just minutes, but hours, for the market to reach an agreement about the meaning of the announcement. After the Fed abandoned the money supply target in October 1982, this announcement effect disappeared.

The Japanese money supply announcement did not have much effect on the yen/dollar exchange rate at

¹T. Ito and V. V. Roley, "News from the United States and Japan: Which Moves the Yen/Dollar Exchange Rate?" NBER Reprint No. 889, August 1987, and *Journal of Monetary Economics* 19, 2 (1987), pp. 255-277.

any time, suggesting that the market did not believe that the Bank of Japan followed strict money supply targeting. Nor did announcements of the price index or of industrial production in the United States prompt significant responses in the yen/dollar exchange rate.

Although the announcement of the price index in Japan did not affect the exchange rate, announcement of Japan's industrial production index had an impact on the exchange rate for some periods into the future. This suggests that the market believed that Japanese policy would respond to news about economic growth.

Intradaily Exchange Rate Dynamics: After the Plaza Agreement

In examining the sharp appreciation of the yen after the Plaza Agreement, I find that large changes usually, but not always, accompany the arrival of news in the market.² For example, the large appreciation in the yen during New York market hours following the Plaza Agreement indicates that the shift in U.S. policy toward more policy cooperation with other countries was responsible. The yen appreciation in late October 1985, mainly during the Tokyo market hours, corresponds to the surprising increase in interest rates engineered by the Bank of Japan at that time. These were both instances when the market-specific news moved the exchange rate during the market hours in that market, but not in other countries.

The reasons for yen appreciation in the first half of 1986 are not as clear-cut. Yen appreciation occurred not only in the Tokyo and New York markets but also in the European market, indicating that some factor, such as the decrease in oil prices, played a role along with monetary news in Tokyo and New York.

Heat Waves versus Meteor Showers

Once the market becomes volatile (that is, undergoes large changes), it stays that way for weeks or months. If volatility clustering reflects the clustering of country-specific news (as in a "heat wave" in one country), then volatility should be correlated only daily in the specific market. However, if the volatility clustering occurs around the clock in many countries (as in a worldwide meteor shower), then it is caused by random policy coordination or by information being digested over a prolonged period.

Robert F. Engle III, Wen-Ling Lin, and I show that volatility clustering is like a meteor shower.³ Once there

²T. Ito, "The Intradaily Exchange Rate Dynamics and Monetary Policies After the Group of Five Agreement," NBER Reprint No. 954, December 1987, and *Journal of the Japanese and International Economies* 1, 1 (1987).

³R. F. Engle III, T. Ito, and W.-L. Lin, "Meteor Showers or Heat Waves? Heteroskedastic Intradaily Volatility in the Foreign Exchange Market," NBER Working Paper No. 2609, June 1988, and *Econometrica*, forthcoming; and "Where Does the Meteor Shower Come From? Capital Control, Stochastic Policy Coordination, or Private Information?" forthcoming as an NBER Working Paper.

is a large jump in one market, the volatility spills over to the next market that opens. This meteor shower volatility existed after the Plaza Agreement, and during the first half of the 1980s, when the policy coordination among the industrialized countries was almost nonexistent. Thus, we conclude that volatility clustering within a day is caused mainly by slow processing of information in the market.

Micro Survey Data

I also analyze panel data from the expectations survey of the Japan Center of International Finance (JCIF) and find that market participants are persistently heterogeneous.⁴ Biases among the participants are statistically significant: exporters have a depreciation bias and importers and trading companies have an appreciation bias. Exporters gain from yen appreciation, given that price pass-through is incomplete.

These kinds of "wishful expectations" can be explained either as naive, nonrational behavior or as sophisticated, manipulative behavior. The usual test of rationality (orthogonality of forecast errors from information available at the time of forecast) reveals that many participants have irrational expectations.

A recent appreciation in the yen creates an expectation of a further yen appreciation in the short run (say, one month) and an expectation of depreciation in the long run (six months). I also find that these short- and long-run expectations are not internally consistent in the JCIF dataset and in survey data from the United States and Europe.⁵

⁴T. Ito, "Foreign Exchange Rate Expectations: Micro Survey Data," NBER Working Paper No. 2679, August 1988, and *American Economic Review*, forthcoming.

⁵K. A. Froot and T. Ito, "On the Consistency of Short-Run and Long-Run Exchange Rate Expectations," NBER Working Paper No. 2577, April 1988, and *Journal of International Finance and Money*, forthcoming.

The Conflict Between Managers and Shareholders

Randall Mørck, Andrei Shleifer,
and Robert W. Vishny

Economists since Adam Smith have been concerned that professional managers who own little equity in the companies they run have little incentive to serve their shareholders. This concern peaked during the Great Depression, rose again during the 1960s, and resurfaced in the 1980s with the advent of hostile takeovers. The recent concern has stimulated new empirical work asking whether managers indeed fail to serve their

shareholders, and how financial markets discipline such managers. As a result of this work, we now know a lot more about the conflict between managers and shareholders than we did ten years ago.

Is Low Ownership by Managers Indeed a Problem?

Underlying the discussion of the conflict between managers and shareholders is the belief that managers who own few shares in firms they run do not maximize profits. But is this belief correct? Do the firms with lower management ownership indeed perform worse than firms with higher management ownership? For a sample of 371 *Fortune* 500 companies in 1980 we find that the answer is yes at low levels of management ownership.¹ Performance of firms with management ownership between 5 and 20 percent, as measured by profitability or by the ratio of market value to the replacement cost of assets, is indeed better than the performance of firms with management ownership between zero and 5 percent. This result is consistent with the standard view that ownership gives incentives for better performance.

However, we also find that performance deteriorates as management ownership rises beyond 20 percent. This result suggests that managers who own controlling blocks of shares do not care so much about becoming even richer than they already are and use their complete control to pursue personal objectives that might well be different from value maximization.

Managers of large public corporations typically own much less than 5 percent of their firms' total shares. The traditional concern that ownership levels are too low to guarantee top performance therefore is supported by the data.

What Do Managers Do That Hurts Shareholders?

Managers have many objectives that might lead them to make decisions that do not maximize value. Often they would like their firms to grow beyond what is profitable to provide opportunities for themselves and for other employees as well as to increase the scope of their control. Managers also try to reduce risk by diversifying or by having too little leverage, since they worry a great deal more about the firm's risk than do the shareholders. Some managers also buy lavish perquisites with company money, such as airplanes, or museums named after themselves, although such perquisites hardly can reduce the firm's value much.

Understanding the managers' objectives helps us look for decisions that do not maximize value. For example, are acquisitions that are likely to serve the inter-

est of managers indeed the ones that hurt the bidding firms' shareholders? Specifically, how do the stock prices of bidding firms change when they announce different types of acquisitions?² We find considerable support for the view that acquisitions that hurt the bidding firms' shareholders tend to serve managers. For example, bidders who buy rapidly growing firms tend to pay too much and so lose market value when they announce such acquisitions. Of course, pursuing growth is a well-known objective of managers. We also find that bidders who buy firms outside the lines of business in which they currently operate lose market value (particularly in the 1980s). Again, diversification is typically a managerial rather than a shareholder objective. Although the short-term market reaction is not always a good gauge of the wisdom of an acquisition, it is a telling fact that these short-run reactions are negative only when the managers are likely to benefit.

Of course, overpaying for an acquisition is not the only managerial action that can hurt shareholders. Previous studies have shown that the stock market also reacts negatively to the announcements of other investment projects, particularly in oil exploration. There is also ample evidence that managers adopt anti-takeover provisions and resist takeovers more generally, even when such actions reduce the market values of their firms. Interestingly, several studies have shown that managers with low ownership stakes are more likely to make value-reducing acquisitions and to resist value-increasing takeovers of their own firms. These results confirm the view that low stock ownership in part is responsible for the prevalence of behavior that does not maximize value.

What Are the Forces That Discipline Managers?

In light of the clear evidence that some managerial actions hurt shareholders, why don't shareholders do something about it? In principle, the task of monitoring the managers to assure that they serve shareholders is entrusted to the board of directors, whom shareholders elect as their representatives. In practice, however, are the boards keen and energetic proponents of shareholder causes, keeping managers on their toes, or are they just passive endorsers of managerial wishes? The evidence suggests that the answer is somewhere in between.

Recent studies show that poor managerial performance leads to a higher probability of internally precipitated turnover of the top management.³ However, the incidence of such turnover is very low, and only very poor performance for a long time brings about

¹R. Mørck, A. Shleifer, and R. W. Vishny, "Management Ownership and Corporate Performance: An Empirical Analysis," *NBER Working Paper No. 2055*, October 1986, and *Journal of Financial Economics* (March 1988).

²R. Mørck, A. Shleifer, and R. W. Vishny, "Do Managerial Objectives Drive Bad Acquisitions?" *NBER Working Paper No. 3000*, June 1989.

³J. B. Warner, R. L. Watts, and K. H. Wruck, "Stock Prices and Top Management Changes," *Journal of Financial Economics* (1988).

turnover, which is usually an early retirement and hardly ever an outright dismissal. We have found that boards tend to respond to particularly poor performance of a firm relative to its industry peers by precipitating turnover of the top management.⁴ Boards appear to need a great deal of evidence that top managers are performing poorly, gained by looking at relative performance, before they encourage them to leave. Because boards typically are not very sure and certainly do not take negative stock market reactions to acquisition and other announcements as clear evidence of mismanagement, boards do not appear to be very effective in deterring behavior that does not maximize value.

The Disciplinary Role of Hostile Takeovers

The ineffectiveness of the boards of directors in enforcing shareholder interests has made room for an alternative disciplining device: the hostile takeover. The frequency and the size of such takeovers have increased dramatically in the 1980s, and they have become perhaps the most common form of reasserting the preferences of shareholders over those of managers.

The view that hostile takeovers are an alternative disciplining device, practiced when managers deviate from value maximization and when directors fail to address this problem, receives considerable empirical support. We have found that *Fortune* 500 targets of hostile takeovers indeed are very poorly performing companies: the ratios of their market values to the replacement cost of their physical assets are roughly 38 percent below those of all publicly traded *Fortune* 500 companies.⁵ We also have found that these targets of hostile takeovers tend to be in poorly performing industries, as well as being poor performers relative to their industries.⁶ Interestingly, Mitchell and Lehn find that firms that lose market value when they make acquisitions themselves are likely to become future targets of takeovers.⁷ Hostile acquirers sometimes get back at managers whose actions reduce market values of their firms.

Conclusion

Our research, as well as that of many others, confirms the empirical significance of the problems identified by Adam Smith. Low management ownership does

⁴R. Mørck, A. Shleifer, and R. W. Vishny, "Alternative Mechanisms for Corporate Control," NBER Working Paper No. 2532, March 1988, and *American Economic Review* (September 1988).

⁵R. Mørck, A. Shleifer, and R. W. Vishny, "Characteristics of Hostile and Friendly Takeover Targets," NBER Working Paper No. 2295, June 1987, and in *Takeovers: Causes and Consequences*, A. J. Auerbach, ed. Chicago: University of Chicago Press, 1988.

⁶R. Mørck, A. Shleifer, and R. W. Vishny, "Alternative Mechanisms for Corporate Control."

⁷Mitchell and Lehn, "Do Bad Bidders Become Good Targets?" *Journal of Political Economy*, forthcoming.

cause performance problems. Managers with low ownership stakes do pursue policies that help themselves but hurt shareholders. Boards of directors at best are only partially effective in restraining such behavior of managers. Finally, hostile takeovers do tend to help shareholders of poorly performing firms to realize at least some of the value of their investment.

Economic Outlook Survey

Third Quarter 1989

Victor Zarnowitz

According to the September survey of 15 professional forecasters taken by the NBER and the American Statistical Association, real GNP is expected to grow by 2.7 percent this year and 1.7 percent in 1990. Inflation as measured by the consumer price index (CPI) is forecast to fall from 5.1 percent in 1988-9 to 4.7 percent in 1989-90. Short- and long-term interest rates also are predicted to be lower on average in 1990 than in 1989.

Views on Recession and Unemployment: Divided but Stable

There is little change from the previous survey in the estimated probabilities of a recession. The mean estimates of the probability that total output will decline are 12 percent, 17 percent, 23 percent, 29 percent, and 29 percent for the five successive quarters 1989:3-1990:3. They are skewed to the right: that is, the medians are smaller than the means. The interquartile ranges shift upward from 0-15 percent for 1989:3 to 10-38 percent for 1990:3. In sum, a few forecasters see the likelihood of a recession in the year ahead as rising to a relatively high level, but most do not.

Most forecasters see the unemployment rate as increasing slightly. The medians are 5.4 percent for both 1990:3 and 1990 as a whole; the means are slightly higher. The ranges are 5.0-6.2 percent for 1990:3 and 5.1-6.5 percent for 1990.

Projections of GNP and Other Economic Indicators, 1989-90

	Annual				
	1988 Actual	1989 Forecast	1990 Forecast	Percent Change	
				1988 to 1989	1989 to 1990
1. Gross National Product (\$ billions)	4880.6	5230.0	5553.1	7.2	6.2
2. GNP Implicit Price Deflator (1982 = 100)	121.3	126.6	132.0	4.4	4.3
3. GNP in Constant Dollars (billions of 1982 dollars)	4024.4	4132.0	4203.5	2.7	1.7
4. Unemployment Rate (percent)	5.5	5.3	5.4	-0.2 ¹	0.1 ¹
5. Corporate Profits After Taxes (\$ billions)	168.9	172.4	176.1	2.1	2.1
6. Nonresidential Fixed Investment (billions of 1982 dollars)	493.8	511.0	526.0	3.5	2.9
7. New Private Housing Units Started (annual rate, millions)	1.5	1.4	1.5	-4.6 ²	4.1 ²
8. Change in Business Inventories (billions of 1982 dollars)	27.9	21.5	20.5	-6.4 ³	-1.0 ³
9. Treasury Bill Rate (3-month, percent)	6.7	8.1	7.4	1.4 ¹	-0.6 ¹
10. Consumer Price Index (annual rate)	4.1	5.1	4.7	1.0 ¹	-0.4 ¹

	Quarterly							Percent Change	
	1989 Q2 Actual	1989		1990			Q2 89 to Q2 90		
		Q3	Q4	Q1	Q2	Q3		Forecast	
1. Gross National Product (\$ billions)	5194.9	5269.0	5342.0	5419.2	5524.0	5610.0	6.3	6.5	
2. GNP Implicit Price Deflator (1982 = 100)	126.0	127.3	128.6	129.9	131.1	132.8	4.1	4.3	
3. GNP in Constant Dollars (billions of 1982 dollars)	4123.9	4140.0	4158.0	4166.5	4185.1	4218.6	1.5	1.9	
4. Unemployment Rate (percent)	5.3	5.3	5.4	5.4	5.4	5.4	0.1 ¹	0.1 ¹	
5. Corporate Profits After Taxes (\$ billions)	170.6	171.5	173.5	172.5	174.4	177.0	2.2	3.2	
6. Nonresidential Fixed Investment (billions of 1982 dollars)	510.2	515.0	518.2	521.0	523.5	527.0	2.6	2.3	
7. New Private Housing Units Started (annual rate, millions)	1.4	1.4	1.4	1.4	1.5	1.5	8.2 ²	5.7 ²	
8. Change in Business Inventories (billions of 1982 dollars)	22.0	20.0	18.5	21.0	21.3	22.3	-0.8 ³	2.3 ³	
9. Treasury Bill Rate (3-month, percent)	8.4	7.9	7.8	7.6	7.5	7.4	-0.9 ¹	-0.5 ¹	
10. Consumer Price Index (annual rate)	6.6	4.3	4.5	4.7	4.6	4.6	-2.0 ¹	0.3 ¹	

SOURCE: The National Bureau of Economic Research and American Statistical Association, Business Outlook Survey, September 1989. The figures on each line are medians of fifteen individual forecasts.

¹Change in rate, in percentage points.

²Possible discrepancies in percentage changes are caused by rounding.

³Change in billions of dollars.

Somewhat Lower Inflation Expected Next Year

The median forecast of the GNP implicit price deflator (IPD) is 4.4 percent in 1988-9 and 4.3 percent in both 1989-90 and 1989:3-1990:3. In terms of the CPI, inflation rates are expected to average between 4.3 percent and 4.7 percent in 1989:3-1990:3. Most of the individual predictions fall between 4 percent and 5 percent, with the outliers near 3 percent and 6 percent.

The mean probability distributions of relative changes in IPD exhibit persistent and high uncertainty about inflation in 1990. However, the following table indicates a moderate decline in inflation forecasts since the June survey.

Percentage Change in IPD	1988-9	1989-90	1989-90 (June)
8 percent or more	0	4	4
6.0-7.9 percent	8	13	15
4.0-5.9 percent	76	56	61
Less than 4.0 percent	16	27	20

A Short-Lived Slowdown and Uncertain Improvement

The median forecasts of the annual growth rates in the economy's output are close to 1.6 percent for 1989:3, 1989:4, and 1990:2; 0.8 percent for 1990:1; and 3.2 percent for 1990:3. There are only three single-quarter de-

clines among the individual predictions and no declines of longer duration. The record shows that expectations of sluggish growth (below 2 percent annual rate) prevail for the second half of 1989, but that gradually they give way to expectations of higher growth rates later in 1990. Between 1989:3 and 1990:3, real GNP is expected to gain 1.9 percent.

Although 1990 should be better than the second half of 1989, according to the forecasts it will have less real growth than 1989 overall. Percentage distributions of the means, calculated from the probabilistic forecasts of output reported by the survey participants, indicate an almost 50-50 division between optimists and pessimists. Still, this is somewhat better than the corresponding results in the June survey, when pessimists outnumbered optimists 60-40.

<i>Percentage Change in Real GNP</i>	<i>1988-9</i>	<i>1989-90</i>	<i>1989-90 (June)</i>
4.0 percent or more	4	6	4
2.0-3.9 percent	73	45	39
0-1.9 percent	23	39	44
Negative	0	10	13

Lower Interest Rates, Too

The medians from the new NBER-ASA survey predict that the three-month Treasury bill rate will average 7.8 percent in 1989:3 (down from the actual 8.4 percent in 1989:2). Thereafter, the rate is forecast to decline by approximately 0.1 percent per quarter, to 7.4 percent in 1990:3. The median for 1990 is about the same; the range of forecasts is 6.5-8.9 percent. The corresponding mean is slightly higher (7.6 percent, with a standard deviation of 0.8 percent). As many as 80 percent of the forecasters expect the T-bill rate to be lower in 1990:3 than in 1989:2, and to be lower overall in 1990 than in 1989.

The yield on new high-grade corporate bonds also is predicted to decline from 9.7 percent in 1989:2 to 9.1 percent in 1989:3, then slightly to 9.0 percent in the first half of 1990. The forecasts for 1990:3 average 9.2 percent and range from 7.9-10.0 percent. Thus, most forecasters expect the long-term interest rates to be fairly stable in the year ahead but to stay considerably lower than they were in the first half of 1989.

Forecasts of both the bill rate and the bond yield declined since the previous survey.

Consumption Steady, Housing Weak but Improving

Real personal consumption expenditures are predicted to grow approximately in step with real GNP in 1989:3-1990:3 at 1.9 percent. Their gains in 1988-9 and 1989-90 should be 2.2 percent and 2.0 percent, respectively.

Housing starts are expected to decline by 4.6 percent in 1988-9 but to rise by 5.7 percent in 1989:3-1990:3 and 4.1 percent in 1989-90. For residential fixed investment in 1982 dollars, the corresponding median forecasts are -1.6 percent, 2.2 percent, and -0.2 percent.

Business Investment Relatively Strong

Nonresidential fixed investment in 1982 dollars is expected to increase by 3.5 percent in 1988-9, 2.3 percent in 1989:3-1990:3, and 2.9 percent in 1989-90, considerably above expected growth in real GNP.

Business inventory investment generally is expected to be positive. The inventory change is forecast to average a little above \$20 billion of 1982 dollars in both 1989 and 1990, not much lower than in 1988. Although the individual forecasts vary a great deal for this volatile series, no absolute declines in inventories are anticipated.

Small Gains in Industrial Production, Corporate Profits, and Trade

Industrial production (output of manufacturing, mining, and utilities) is forecast to rise a strong 3.4 percent in 1988-9, but only 0.9 percent in 1989:3-1990:3, and 1.6 percent in 1989-90. For corporate profits after taxes in current dollars, the corresponding annual growth rates are 2.1 percent, 3.3 percent, and 2.1 percent.

Net exports of goods and services in millions of 1982 dollars are predicted to average -75 in 1988, -52 in 1989, and -47 in 1990. This implies a decrease in the real trade deficit reductions to be achieved. The forecasts reflect the recent revision of the underlying data.

Smaller Increases in Government Spending

Federal government purchases of goods and services in constant dollars are expected to rise 3.3 percent in 1988-9 and 0.3 percent in 1989-90. Defense outlays generally are expected to change very little or decline slightly in the year ahead.

Most forecasts imply moderate and steady real growth for state and local government purchases (2.5 percent in 1988-9, 2.6 percent in 1989:3-1990:3, and 2.3 percent in 1989-90).

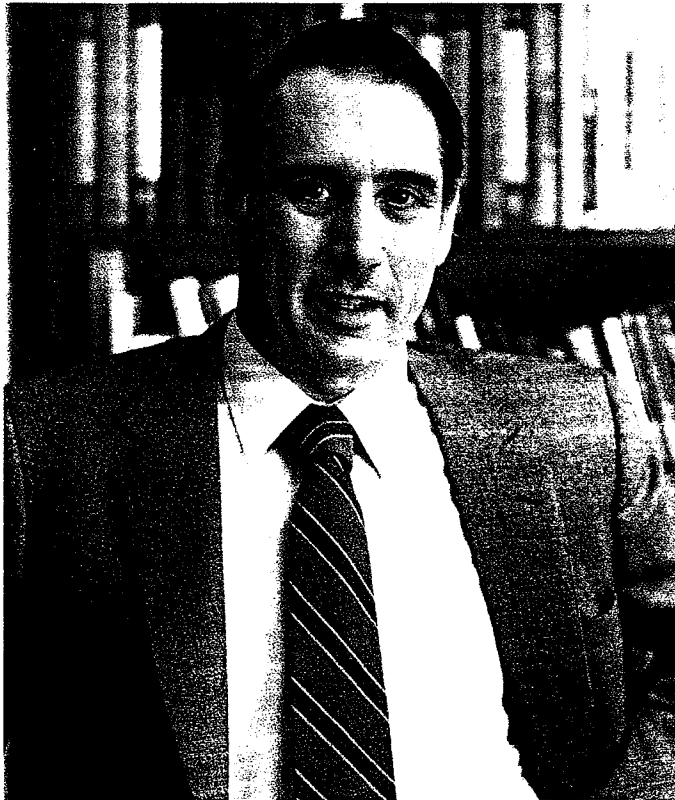
Major Assumptions

Most forecasters assume "no significant changes" in tax policy. Some respondents consider the probability of small tax increases and a reduction in the capital gains tax in the year ahead. The few reported assumptions about monetary growth rates are concentrated between 2 percent and 6-7 percent for both 1989 and 1990 and for both M1 and M2. The views on energy demand and prices are fairly evenly divided between those who expect stability and those who specify increases. The quoted prices of oil vary in the range of \$15-22 per barrel. The views on the dollar are divided similarly between rises and declines, but most of the expected changes are described as "slight" or "moderate."

This report summarizes a quarterly survey of predictions by 15 business, academic, and government economists who are professionally engaged in forecasting and are members of the Business and Economics Statistics Section of the American Statistical Association. Victor Zarnowitz of the Graduate School of Business of the University of Chicago and NBER, assisted by Robert E. Allison and Deborah A. Nicholson of NBER, was responsible for tabulating and evaluating this survey.

William C. Brainard

William C. Brainard, a member of the NBER's Board of Directors since 1988, is the Frederick W. Beinecke Professor of Economics at Yale University. He joined the economics faculty at Yale as an assistant professor in 1962, and was named full professor in 1969.



Brainard received his B.A. from Oberlin College and his M.A. and Ph.D. degrees from Yale. He was provost of Yale University from 1981-6, and director of the Cowles Foundation for Research in Economics from 1971-3 and again from 1976-81. Brainard also has been a visiting professor at the University of California at San Diego and the University of Essex (England).

His work on financial markets has been published in the *American Economic Review* and in other leading journals. He is currently coeditor of the *Brookings Papers on Economic Activity*.

Brainard and his wife Ellen live in New Haven. They have three grown sons. He is an outdoor sports enthusiast and enjoys repairing old cars and houses.

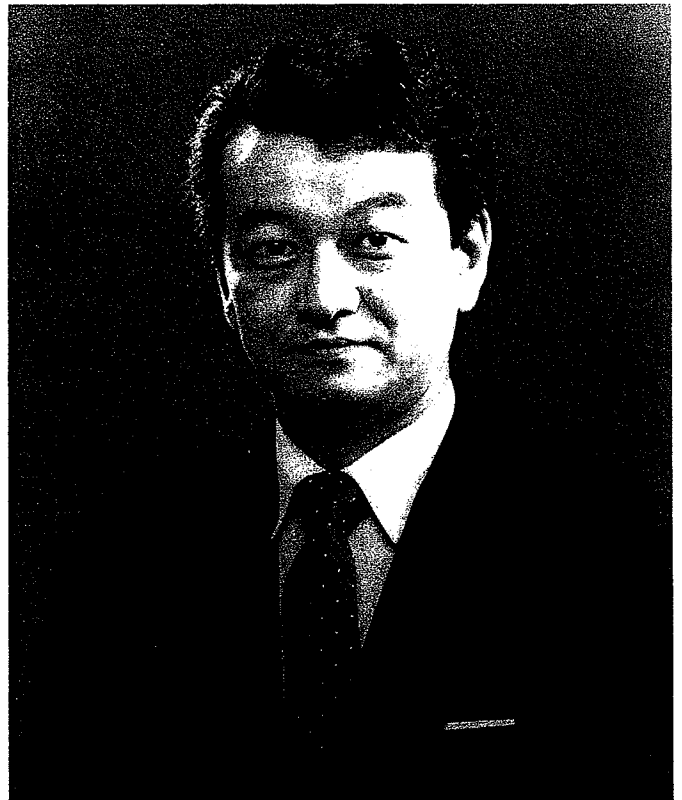
Takatoshi Ito

Takatoshi Ito is a research associate in the NBER's Programs in Financial Markets and Monetary Eco-

nomics and International Studies. He holds a B.A. and M.A. in economics from Hitotsubashi University (Tokyo), and an M.A. and Ph.D. in economics from Harvard University.

Ito was named assistant professor of economics at the University of Minnesota in 1979 and was promoted to associate professor in 1986. He also has had a joint appointment in East Asian Studies at Minnesota since 1983. Ito has taught macroeconomics, microeconomics, mathematical economics, and a course on the Japanese economy. He was a visiting professor at Stanford University in 1984-5 and at Harvard University in 1986-7.

Ito's work on the Japanese economy and on international finance (especially U.S.-Japan interdependence) has been published in many professional journals. Presently he is a coeditor of the *Journal of Japanese and International Economies*.

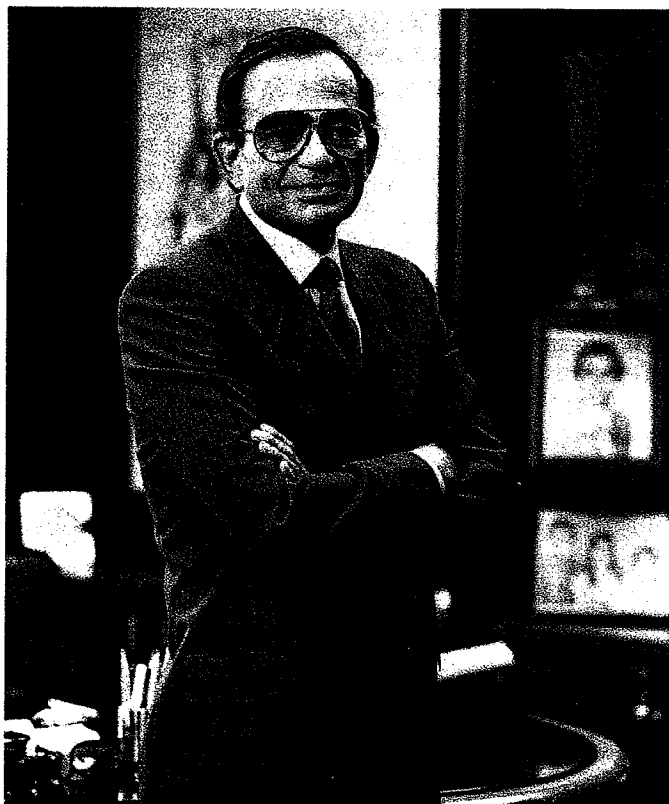


Ito and his wife, Keiko, have two children, Hana (4) and Ken (2). When he finds the time, Ito likes to play violin, accompanied by Keiko, who is a music therapist.

Leo Melamed

Leo Melamed, chairman of the Executive Committee of the Chicago Mercantile Exchange (CME), became a member of the NBER's Board of Directors in 1988. An attorney, Melamed received his Doctor of Jurispru-

dence (J.D.) degree from the John Marshall Law School (Chicago) in 1955.



Melamed is the founder and architect of financial futures, which he introduced at the CME in 1972. In 1982, he became chairman of the National Futures Association, a congressionally sanctioned self-regulatory body. He is also an advisor to the Commodity Futures Trading Commission, a federal agency, and has lectured and written extensively about financial futures markets. An active futures trader, Melamed is chairman of Dellsher Investment Company.

Melamed was editor of *An Anthology: The Merits of Flexible Exchange Rates*, published in 1988. He is a Life Master in bridge and authored a science fiction novel, *The Tenth Planet*, published in 1987.

Research Associate R. Glenn Hubbard of Columbia University organized the following program:

Bruce C. Greenwald, Bell Communications Research; Joseph E. Stiglitz, NBER and Stanford University; and Andrew Weiss, NBER and Boston University, "Models of Equity and Credit Rationing"

Discussant: Mark Gertler, NBER and University of Wisconsin

Roger E. A. Farmer, University of California at Los Angeles, "A.I.L. Theory and the Ailing Phillips Curve: A Contract-Based Approach to Aggregate Supply" (NBER Working Paper No. 3115)

Discussant: R. Glenn Hubbard

William A. Brock and Blake LeBaron, University of Wisconsin, "Liquidity Constraints in Production-Based Asset Pricing Models" (NBER Working Paper No. 3107)

Discussant: Bruce N. Lehmann, NBER and Columbia University

Michael Devereux, Institute for Fiscal Studies, London; and Fabio Schiantarelli, Boston University, "Investment, Financial Factors, and Cash Flow: Evidence from U.K. Panel Data" (NBER Working Paper No. 3116)

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

Peter C. Reiss, NBER and Stanford University, "The Economic and Financial Determinants of Oil and Gas Exploration Activity" (NBER Working Paper No. 3077)

Discussant: John Meyer, Harvard University

John Meyer, and John Strong, College of William and Mary, "Free Cash Flow and Discretionary Investment: A Residual-Funds Study of the Paper Industry"

Discussant: Steven M. Fazzarri, Washington University

William Gale, University of California at Los Angeles, "Information, Collateral, and Government Intervention in Credit Markets" (NBER Working Paper No. 3083)

Discussant: Andrew Weiss

Jeffrey K. MacKie-Mason, "Does Internal Financing Differ from External?"

Discussant: David Scharfstein, MIT

Colin Mayer, City University, London, "Financial Systems, Corporate Finance, and Economic Development"

Discussant: Roger E. A. Farmer

Robert A. Korajczyk and Deborah Lucas, Northwestern University; and Robert L. McDonald, NBER and Northwestern University, "Stock Price and Earnings Behavior Around the Time of Equity Issues"

Discussant: Jeremy Stein, Harvard University

Takeo Hoshi, University of California at San Diego; Anil Kashyap, Federal Reserve Board; and David Scharfstein, "Bank Monitoring and Investment: Evidence from the Changing Structure of Japanese

Conferences

Information, Capital Markets, and Investment

The NBER held a conference on "Information, Capital Markets, and Investment" in Cambridge on May 5-6.

Corporate Banking Relationships" (NBER Working Paper No. 3079)

Discussant: James Kahn, University of Rochester
John Pound, Harvard University; and Richard J. Zeckhauser, NBER and Harvard University, "Are Large Shareholders Effective Monitors? An Investigation of Share Ownership and Corporate Performance"
Discussant: Gary Gorton, University of Pennsylvania

Greenwald, Stiglitz, and Weiss consider the effects on investment decisions of equity and credit rationing at the firm level. They model the banking sector, which is assumed to be effectively constrained in raising new equity capital. The availability of credit to firms depends on the financial condition (accumulated internal net worth) to both firms and the banking sector, reinforcing the accelerator mechanism in investment. In the short run, the effects of monetary policy on investment and output are magnified through relaxation of financing constraints. Long-run dynamics are driven by rates of accumulation in capital and internal equity.

Farmer focuses on movements in interest rates in bringing about Phillips curve correlations in data. He stresses the role of the nominal interest rate: for the firm, the optimal contract trades off the opportunity cost of holding liquid balances against the benefits of additional liquidity. The benefits arise from the fact that liquidity buffers permit firms to offer more stable wages, facilitating more efficient employment decisions. Using data for the United States for 1931-86, Farmer finds that movements in the unemployment rate are negatively correlated with movements in inflation and corporate profits and positively correlated with movements in nominal interest rates.

Brock and LeBaron consider the impact of financial constraints on the market valuation of firms. They use a particular class of asset pricing models to analyze mean reversion in security returns and find that it is amplified by financing constraints: positive shocks to productivity affect a constrained firm's investment program more than the program of an unconstrained firm. Binding credit constraints are an important feature of mean-reverting returns in security markets.

Devereux and Schiantarelli use panel data on 689 U.K. manufacturing firms during 1969-86, to test for differences in the sensitivity of investment to the availability of internal funds for firms of different sizes and ages. They find that lagged measures of firm cash flow have an important effect on investment, holding constant investment opportunities (as measured by q); this effect is present for all sizes of firms. Devereux and Schiantarelli find that cash flow effects are particularly important for younger, smaller firms, perhaps because of information problems. They note that the cash flow effects for large firms could reflect their more diversified ownership structure and greater associated agency costs of finance.

Reiss analyzes investment behavior over the past decade for firms in oil and gas extraction. The large fluctuations in oil and gas prices led to significant changes

both in investment opportunities and in the value of firms' net worth (as measured by the value of oil and gas reserves in place). Fluctuations in capital spending in the industry over this period were much more pronounced than in the economy as a whole. Reiss finds that during the 1986 downturn, shortages in internal finance accentuated declines in investment spending. He also finds that smaller producers experience relatively greater fluctuations in internal finance, and hence investment. A firm's liquidity position also affects its positions regarding ownership of wells. Smaller firms, and firms with less internal finance, hold significantly smaller interests in each well that they drill.

Meyer and Strong ask whether firms with larger "free" cash flows exhibit different investment behavior from other firms and whether these differences in investment behavior might lead to poorer or better financial performance. They consider investment decisions in 34 large paper companies from 1971 to 1986. The paper industry experienced substantial fluctuations in operating performance during that time, and has undergone considerable restructuring. Meyer and Strong confirm that discretionary investment is influenced by movements in residual funds. Moreover, links between discretionary investment and shareholder returns are consistent with an agency-cost interpretation: higher discretionary expenditures depress shareholder returns.

Gale considers the efficiency costs generated by using collateral as a sorting device when it is worth less to lenders than to borrowers. In equilibrium, relatively high-risk borrowers choose a contract with a high interest rate and low collateral requirement; low-risk borrowers choose to put up substantial collateral in exchange for a lower interest rate. As long as all borrowers have projects whose gross returns are greater than their social opportunity cost, government intervention can decrease the efficiency loss created by the use of collateral. Subsidies to unrationed borrowers will reduce the extent of rationing in the whole sector and will increase efficiency. On the other hand, interventions that target borrowers who are denied loans in private credit markets can raise the extent of rationing and reduce efficiency.

MacKie-Mason documents trends and patterns in incremental sources of financial capital at the industry and aggregate level and analyzes a large sample of incremental corporate financial decisions. He distinguishes between debt or equity financing and between privately or publicly marketed sources. Using data drawn from SEC-registered offerings, matched with COMPUSTAT data on firm characteristics, MacKie-Mason finds that problems of asymmetric information are an important determinant of financing choices. That is, firms are concerned with who provides their financing and not just with the standard factors thought to influence the mix of "debt" and "equity" finance.

In his overview of financing patterns in the United States, United Kingdom, Japan, Italy, Germany, France, Finland, and Canada, Mayer describes some common trends in corporate finance. Those patterns include

the dominance of internal funds in financing investment, the importance of bank finance as a source of external funds, and systematic variations in financing patterns across firms of various sizes. Mayer believes these common factors support recent models linking corporate finance to corporate control. The particular link he stresses is the claim that outside investors can make in the event of a default by insiders. In particular, assets specific to their current employment will be difficult to finance externally, and the use of external finance will be related negatively to the cost of organizing external control.

Korajczyk, Lucas, and McDonald note that stock prices increase just prior to an equity issue and then drop just after the issue. They assume that managers—who act in the interest of existing shareholders—have private information about the firm's true value. Korajczyk, Lucas, and McDonald find that price increases occur prior to secondary issues (large block sales by existing equity holders) that reveal information but have nothing to do with additions to the firm's capital. On the other hand, firms that issue equity experience a rise in Tobin's q prior to the issue and a subsequent fall: a pattern consistent with firms' issuing equity to finance growth opportunities.

In the early 1980s, Japan eased restrictions on issuing bonds abroad, and for the first time permitted the issuance of noncollateralized bonds in domestic securities markets. Firms' reliance on banks for debt finance diminished substantially during this period. Hoshi, Kashyap, and Scharfstein compare firms that decreased their reliance on main bank finance (seeking finance instead from domestic and foreign bond markets) with firms that retained their bank ties. For the latter group, investment remained insensitive to movements in firm liquidity (holding constant investment opportunities) before and after banking deregulation. For the former, investment spending became more sensitive to fluctuations in firm liquidity.

Pound and Zeckhauser outline the potential impact of large shareholders on insiders' incentives and the flow of information. They then use cross-sectional data on firms to test for systematic variation in performance among firms with large shareholders (after controlling for industry differences). Pound and Zeckhauser classify industries according to whether capital and investments are highly firm-specific. When assets are specific to the management, it is more difficult for large shareholders (acting as monitors) to improve performance. They find that earnings-price ratios (their measure of performance) are significantly lower for firms with large shareholders in industries in which assets are less specific and monitoring is easier. There is no comparable "large shareholder" effect for firms in industries in which assets are firm-specific.

Also attending were: Carliss Y. Baldwin and Benjamin M. Friedman, NBER and Harvard University; Ben S. Bernanke, NBER and Princeton University; David Bizer, Johns Hopkins University; Charles W. Calomiris, Northwestern University; Geoffrey Carliner, NBER;

Andrew W. Lo and James M. Poterba, NBER and MIT; Frederic S. Mishkin, NBER and Columbia University; Bruce C. Petersen, Federal Reserve Bank of Chicago; Terry Vaughn, MIT Press; Mark A. Wolfson, Stanford University; and Stephen P. Zeldes, NBER and University of Pennsylvania.

The conference papers and discussions are expected to be published by the University of Chicago Press. The availability of the volume will be announced in the *NBER Reporter*.

International Seminar on Macroeconomics

The twelfth annual International Seminar on Macroeconomics (ISOM) was held in Paris on June 19–20. ISOM is cosponsored by the National Bureau of Economic Research, the Maison des Sciences de l'Homme, and the European Economic Association. This year it was hosted by the Banque de France at the Château de la Vrillière in Paris. ISOM is organized jointly by Robert J. Gordon of the NBER and Northwestern University and Georges de Mènil of the Ecole des Hautes Etudes en Sciences Sociales.

The major themes of this year's meeting were deregulation and trade liberalization in the context of Europe in 1992. Topics discussed included: welfare effects of trade liberalization; economic integration in imperfectly competitive markets; job security and employment; internal and external economies; industrial policy in the airline industry; intrafirm trade in the manufacturing industries; and financial deregulation in Japan. The papers and their discussants were:

Victor Norman, Norwegian School of Economics and Business Administration, "Assessing Trade and Welfare Effects of Trade Liberalization"

Discussants: William H. Branson, NBER and Princeton University; and Alan Winters, University College of North Wales

Anthony Venables, University of Southampton, "The Economic Integration of Oligopolistic Markets"

Discussants: Henryk Kierzkowski, Institute of Graduate Studies, Geneva; and Jean Waelbroeck, Free University of Brussels

Giuseppe L. Bertola, Princeton University, "Job Security, Employment, and Wages"

Discussants: Dennis Snower, Birkbeck College; and Jacques Mairesse, NBER and ENSAE

Ricardo J. Caballero, Columbia University; and Richard K. Lyons, NBER and Columbia University, "Internal versus External Economies in European Industry"

Discussants: Heinz König, Universität Mannheim; and Daniel Cohen, CEPREMAP

Gernot Klepper, Kiel Institute of World Economics, "Entry into the Market for Large Transport Aircraft" Discussants: Robert W. Crandall, Brookings Institution; and Didier Laussel, Université d'Aix-Marseille II

Richard E. Baldwin, NBER and Columbia University, "Measuring 1992's Medium-Term Dynamic Effects" Discussants: Paul R. Krugman, NBER and MIT; and Damien Nevin, INSAED

Takatoshi Ito, NBER and Hitotsubashi University, "Financial Deregulation and Money in Japan, 1985-8" Discussants: Koichi Hamada, NBER and Yale University; and Yves Barroux, Banque de France

Norman's paper addresses two questions: Does the "new" international economics indicate significantly different effects of trade policy on the intersectorial pattern of international trade and the allocation of resources than the conventional theory of competitive advantage? Second, what modeling approach would incorporate the "new" trade theory into computable general equilibrium (CGE) models? Norman uses several numerical model experiments in which CGE models with product differentiation and reciprocal dumping are contrasted with comparative advantage models based on the approach developed by Paul Armington. Norman concludes that imperfect competition matters significantly for interindustry trade and the welfare effects of trade liberalization. Less aggressive competition reduces elasticities of equilibrium quantities, so that comparative advantage is not fully exploited. In addition, the Armington approximation is poor in regard to welfare effects and interindustry trade.

Venables uses a model of international trade under oligopoly to investigate the implications of two types of integration: reductions in the cost of trade, or reductions in the extent to which firms regard markets as being internationally segmented. Economic integration may change the degree of market segmentation and thereby may alter the nature of strategic interaction between firms in different countries. Expanding on his work with Smith, Venables uses a two-stage game model. Three separate points on the spectrum of market integration are identified as Nash equilibriums. Venables shows that if the initial equilibrium is of the intermediate type, then potential gains from further integration of the European market are lower than previous studies have estimated.

Bertola examines the arguments that the poor employment performance of European economies is caused by obstacles to firing that make labor less attractive to firms. Bertola also scrutinizes the theory that firing restrictions may allow incumbent workers to bargain for high wages as they disregard unemployment among "outsiders." He finds that job security provisions do not bias the firm's labor demand toward lower average employment at given wages, just as they do not bias wage determination toward higher wages and lower unemployment. Employment is more stable where job security provisions are stronger. In addition, the medium- and long-run employment performance of the countries

Bertola considers appears unrelated to the extent of job security legislation in those countries. In countries with high job security, wages tend to be lower and more sensitive to "outside" unemployment, suggesting that wages are more strongly influenced by other factors than by job security provisions. In sum, the evidence suggests that job security provisions alone should not be blamed for the poor employment performance of European countries.

Caballero and Lyons estimate internal returns to scale and external economies for two-digit manufacturing industries in four European countries: West Germany, France, the United Kingdom, and Belgium. They find little evidence of increasing returns to scale. However, external economies are evident in all four countries, especially in France and Belgium. Failure to take external economies into account results in upward-biased estimates of internal elasticities of output with respect to capital and labor at the industry level. Caballero and Lyons conclude that economic integration will create substantial external economies and higher growth in many European industries.

European governments have been accused of unfairly subsidizing their large commercial aircraft industries. Klepper examines the likely results of market entry and estimates the additional cost that a firm faces when it is late in entering the market for transport aircraft. In the analysis, a capacity game is calibrated to the expected market for transport aircraft from 1987 to 2006. The results show that it takes a long time to overcome the disadvantage of late entry. Hence, without government subsidies, market entry is unlikely. Klepper finds that the scale and scope effects of production outweigh the output-reducing effects of a monopoly.

Baldwin examines a broad-based market liberalization stemming from the 1992 program in Europe as a source of dynamic gains, specifically in the marginal productivity of capital. In Solow and Arrow growth models, liberalization increases the steady-state capital-labor ratio, leading to a one-time upward shift in output greater than that suggested by the static effect. Baldwin attempts to gauge the effects of 1992 on a country-by-country basis. He finds that the dynamic gain is between 30 and 136 percent of the static effect. Hence, current EC estimates of the increase in GDP resulting from the 1992 integration are anywhere from 30 to 136 percent too small. Baldwin estimates that 1992 will raise GDP by between 3.1 and 25.4 percent. The imprecision of this range is a result of the lack of precise knowledge of the actual output elasticity of capital.

Ito evaluates the effect of recent financial deregulation in Japan on the behavior of money supply and demand. Deregulation in Japan has coincided with decreasing interest rates and a booming stock market, making it difficult to identify the source of the money supply increase. Therefore, Ito estimates the magnitude of deregulation by the size of a shift from conventional to new types of deposits. He finds that a major portion of the observed increases in large-amount time deposits and money market certificates comes from

decreases in other components of money, especially certificates of deposit and small-amount time deposits.

The conference also included a roundtable discussion entitled, "The Macroeconomic Environment of 1992." Among the participants were Michael L. Mussa of the University of Chicago, John Flemming of the Bank of England, and Jacob A. Frenkel of the NBER, the IMF, and the University of Chicago.

Selected papers from ISOM 1989 will be published in the *European Economic Review* in spring 1990.

Studies of Firms and Industries

About 40 economists met in Cambridge on July 11-12 for an NBER conference on Studies of Firms and Industries. Research Associates Timothy F. Bresnahan, Stanford University; R. Glenn Hubbard, Columbia University; and Ariel Pakes, Yale University, organized the following program:

Ricardo J. Caballero, Columbia University; and Richard K. Lyons, NBER and Columbia University, "The Role of External Economies in U.S. Manufacturing" and "Internal versus External Economies in European Industry" (This paper is described in "International Seminar on Macroeconomics.")

Frank R. Lichtenberg, NBER and Columbia University; and Donald Siegel, State University of New York at Stony Brook, "The Effects of Leveraged Buyouts on Productivity and Related Aspects of Firm Behavior" (NBER Working Paper No. 3022)

Steven N. Kaplan, University of Chicago, "Management Buyouts: Evidence on Post-Buyout Operating Changes"

William P. Rogerson, Northwestern University, "Profit Regulation of Defense Contractors and Prizes for Innovation"

Anil Kashyap and David W. Wilcox, Federal Reserve Board, "Production Smoothing at the General Motors Corporation during the 1920s and 1930s"

Thomas J. Holmes, University of Wisconsin at Madison; and James A. Schmitz, Jr., State University of New York at Stony Brook, "A Theory of Entrepreneurship and Its Applications to the Study of Business Transfers"

Timothy F. Bresnahan, and Peter C. Reiss, NBER and Stanford University, "How Much Does Entry Change Competition?"

Tito Boeri, New York University, "Product Choice, Growth of Incumbent Firms, Entry, and Exit"

Caballero and Lyons develop a method for joint estimation of internal returns to scale and external economies. They then estimate indexes of returns to scale for U.S. manufacturing industries at the two-digit level.

Overall, they find that only three of the 20 industry categories show any evidence of internal increasing returns: primary metals, electrical machinery, and paper products. However, there is very strong evidence of external economies, defined as external to a given two-digit industry and internal to the United States. They estimate that if all manufacturing industries simultaneously raise their inputs by 10 percent, aggregate manufacturing production will rise by 13 percent, of which about 5 percent is caused by external economies. Thus, when an industry increases its inputs in isolation by 10 percent, its output rises by no more than 8 percent.

Based on 1100 manufacturing plants involved in leveraged buyouts (LBOs) during 1981-6, Lichtenberg and Siegel find that plants involved in LBOs had significantly higher rates of total factor productivity (TFP) growth than other plants in the same industry. The impact of LBOs on productivity is much larger than the authors' previous estimates of the impact of ownership changes in general on productivity. Management buyouts appear to have a particularly strong positive effect on TFP. Labor and capital employed tend to decline (relative to the industry average) after the buyout, but at a slower rate than they did before the buyout. The ratio of nonproduction-to-production labor cost declines sharply, and wage rates for production workers increase, following LBOs. Plants involved in management buyouts (but not in other LBOs) are less likely to close subsequently than other plants. The average R and D intensity of firms involved in LBOs increased at least as much from 1978 to 1986 as did the average R and D intensity of all firms responding to the NSF/Census Survey of industrial R and D.

Kaplan presents evidence on changes in operating cash flows for a sample of 76 large management buyouts of public companies completed between 1980 and 1986. In the three years after the buyouts, these companies had increased operating income (before depreciation), decreased capital expenditures, and increased net cash flow (the difference between operating income and capital expenditures). Consistent with the operating changes, the (median) combined market adjusted return to pre-buyout public shareholders and post-buyout investors is 77 percent. Kaplan considers three explanations for the post-buyout changes: employment cuts, informational advantages held by managers, and the new incentives created by the buyout. The evidence is strongest for the incentive explanation.

Rogerson argues that constraints on information and incentives require that regulatory institutions create prizes for innovation. Since the quality of an innovation is difficult to describe objectively or to measure, the most natural method for awarding prizes is to allow firms to earn positive economic profit on production contracts. Rogerson calculates the value of the prizes offered on 12 major aerospace systems. The prizes clearly are large enough to support the contention that their existence is an important aspect of the current regulatory structure.

Kashyap and Wilcox examine the development and implementation of production control methods at the General Motors Corporation during the 1920s and 1930s. They show that GM's senior management understood the costs and benefits of production smoothing and implemented an aggressive program of production control roughly 30 years before the economics profession had formally studied the problem. Using new data for 1922 to 1940, Kashyap and Wilcox show that production often was smoother than sales, especially prior to the Great Depression. Critical to this finding, however, is explicit recognition of the importance of model changeover. Production smoothing became less evident after 1932, coincident with a major revision in corporate policy that had the effect of granting greater autonomy to the various divisions of the corporation, and limiting central control. In comparing these policies with current practices, two important lessons emerge. First, both then and now the production planning horizon is tied to the model year. Therefore, there is no direct link between business cycle conditions and inventory positions. Second, to the extent that seasonal variation in demand is an important factor in production and inventory planning, the planning problem has become easier over time because seasonal swings are now much less pronounced than in the prewar era.

Holmes and Schmitz formalize a view of entrepreneurship in which entrepreneurs respond to the opportunities for creating new products that arise because of technological progress. The theory has implications for entry and exit, specialization of labor, and business transfers. These business transfers correspond to individuals changing jobs and sales of firms, among other things. Transfers are seen as a mechanism facilitating division of labor.

Bresnahan and Reiss estimate the equilibrium number of producers in oligopolistic markets, recognizing the importance of scale economies and allowing for heterogeneity in entrants' costs. They show how firms' incentives to enter a market, because of an increase in market demand, depend on the strength of post-entry competition. Using this framework to estimate how entry affects competition in geographically concentrated retail and professional markets, Bresnahan and Reiss find that almost all of the variation in competitive conduct in markets with five or fewer firms occurs in monopolies and duopolies. By the time the market has three to five firms, the next entrant has little effect on competitive conduct.

Studies based on longitudinal samples of business units have found that: 1) job gains from entry of business units systematically exceed job losses caused by exit; 2) growth of incumbent units is unstable; and 3) the growth rate of continuing firms is heterogeneous within sectors. To explain this, Boeri focuses on the interaction between incumbent firms and entrants in a market with product differentiation and uncertainty about the evolution of consumers' preferences over varieties. In the presence of adjustment costs to changing the design of products, entrants might find a more

favorable location than incumbent units and erode their market share. Because entry does not occur immediately after a shock, continuing firms temporarily "overshoot" the level of output that can be sustained by their choice of location.

Topics in Industrial Organization

The NBER held a conference on "Topics in Industrial Organization" in Cambridge on July 31 and August 1. NBER researchers Paul L. Joskow and Nancy L. Rose, both of MIT, organized the following program:

Severin Borenstein, University of Michigan, "Price Discrimination in Retail Gasoline Markets"

Discussant: Andrea L. Shepard, MIT

Ann F. Friedlaender, MIT, "Efficient Rail Rates and Deregulation"

Discussant: John R. Meyer, Harvard University

Michael A. Salinger, Columbia University, "A Test of Successive Monopoly and Foreclosure Effects: Vertical Integration between Cable Systems and Pay Service"

Discussant: Paul L. Joskow

Scott E. Masten and Edward A. Snyder, University of Michigan, and James W. Meehan, Jr., Colby College, "The Cost of Organization"

Discussant: Ingo Volgelsang, Boston University

Randal R. Rucker, North Carolina State University, and Keith B. Leffler, University of Washington, "Transaction Costs and Efficient Organization of Production: A Study of Timber Harvesting"

Discussant: R. Glenn Hubbard, NBER and Columbia University

William P. Rogerson, Northwestern University, "Profit Regulation of Defense Contractors and Prizes for Innovation" (This paper is summarized in "Studies of Firms and Industries" in this issue.)

Discussant: Michael D. Whinston, NBER and Harvard University

James Blumstein, Vanderbilt University; Randall Bovbjerg, Urban Institute; and Frank A. Sloan, NBER and Vanderbilt University, "Valuing Life and Limb in Tort: A Common Law of Damages and Insurance Contracts for Future Services"

Discussant: Joseph P. Newhouse, Harvard University

Michael Moore and W. Kip Viscusi, Duke University, "The Effect of Product Liability on Innovation"

Discussant: Roger G. Noll, Stanford University

Ralph Winter, University of Toronto, "The Dynamics of Competitive Insurance Markets"

Discussant: J. David Cummins, University of Pennsylvania

Why is the retail margin on regular unleaded gasoline consistently higher than the retail margin on regular leaded gasoline? The average difference grew from less than one cent in 1979 to more than five cents in 1986 but since has fallen to about two-and-a-half cents in 1989. Borenstein finds that cost-based explanations—focusing on differences in inventory costs, average size of purchases, or use of credit cards—explain little, if any, of the levels or changes in margin differences. Using a panel of gasoline prices in 57 SMSAs from 1984 to 1989, Borenstein finds price discrimination based on heterogeneity in buyers' costs of switching sellers. As the average income of buyers of leaded gas has fallen relative to the average income of buyers of unleaded gas, the margin difference has widened. After 1986, many stations stopped selling leaded gas—increasing the relative switching costs of buyers of leaded gas—and the margin on leaded gas has risen relative to the margin on unleaded gas. Changes in relative incomes explain a small proportion of the changes in margin differences. But the decline in the availability of leaded gasoline explains between one-quarter and one-half of the change in margin of differences since 1986.

Are “fair” rates to captive shippers compatible with “fair” rates of return for the railroads in the period of quasi-deregulation since 1980? To answer this, Friedlaender develops a model in which a public utility faces a breakeven constraint while selling in two sectors: a competitive one, in which price equals marginal cost, and a captive one, which has to bear the entire revenue burden. The markup in the captive sector depends on the degree of economies of scale and on the marginal-cost revenue shares in the captive and competitive sectors. Using the results of a cost function based on panel data of Class I railroads from 1974–86, Friedlaender shows that under reasonable assumptions concerning the appropriate measure of economies of scale, the two goals are not incompatible in the long run. Thus, the relevant policy question is not whether reregulation should be instituted but how to devise appropriate policies to move from the current situation, marked by a high degree of scale economies, to a long-run equilibrium marked by moderate scale economies.

Salinger compares the prices charged, and the services offered, by vertically integrated and unintegrated cable systems to test for successive monopoly and foreclosure effects. He finds that integrated cable systems are less likely to offer at least three pay channels, and somewhat less likely to offer four pay channels, than unintegrated systems are, but there is no significant difference in the prices charged for pay services by integrated and unintegrated systems.

Masten, Snyder, and Meehan suggest ways of overcoming difficulties inherent in direct tests of economic theories of organization. Specifically, they discuss problems in testing transaction-cost arguments and identify parallels to familiar selection and censoring problems. They then apply these methods to a sample of components from a large naval construction project. The data permit them to: 1) test the relationship

between attributes of the transaction and the costs of organizing, both within and between firms; and 2) provide dollar estimates of those costs.

Rucker and Leffler examine the choice of selling privately owned standing timber by lump sum or per unit. Empirical results, obtained by using primary data on individual private timber sales contracts, support the predictions of a transaction cost model and reject several predictions from a risk-based model of contract choice.

Blumstein, Bovbjerg, and Sloan describe two possible reforms to our tort system: the first is a reporting system to record current damage awards that would have precedent value. Future jury awards in the middle half of the expected distribution would be presumptively valid, and more extreme findings would have to be justified explicitly. This approach would allow the law on appropriateness of damages to progress in common-law, monitored fashion rather than on the traditional ad hoc basis. The second proposal is a method of “structuring” damages for future medical care and other services to injured claimants. It would pay for future services not in cash (whether as a traditional lump sum at settlement or through newer annuity-like periodic payments), but instead by funding an actual service contract for necessary care.

The substantial rise in product liability costs has altered the financial incentives for innovation greatly. Higher liability costs increase the incentive to improve product safety and discourage firms from introducing new high-risk products. At very high levels of liability, firms will abandon innovation and focus on no-risk products, typically those characterized by generally accepted technologies. Moore and Viscusi use two large datasets for 1980–4. They match data from the PIMS survey on R and D, patents, and new product introductions with detailed information on insurance premiums and losses from the Insurance Services Office. They find that product liability has a nonlinear effect on innovation. At low liability levels, increases in liability costs increase measures of innovation, but this influence becomes negative at extremely high levels of innovation. The effects are stronger for product innovation than for process innovation, which is consistent with the greater importance of liability for design defects, as compared with manufacturing defects. The findings are robust across a variety of liability cost measures and are replicated using other data on R and D.

In the conventional economic treatment of insurance pricing, premiums equal the expected present value of claims. Winter offers an alternative, dynamic model of insurance markets based on two assumptions: first, risks are dependent because of common factors in the distribution of losses. This assumption, together with limited liability of insurers, implies that the industry stock of net worth or equity limits the amount of insurance that can be offered credibly at any time. Second, there is a cost advantage to internal capital over external equity in raising financing. An insurance cycle, or persistence of the gap between premiums

and the present value of claims, results. Tight markets or "crises" of high premiums and profits are caused by depletion of capacity (net worth) through bad draws on the common factors. Crises persist because insurers rationally prefer to wait out the rapid accumulation of retained earnings rather than to resort to costly external capital. Soft markets arise from the accumulation of retained earnings and persist because of the chance that the excess stock of internal equity will be needed in the future. In tight markets, gains to trade disappear in the riskiest times when there is dependence in the events of losses. In the context of liability insurance, this dependence is attributed to uncertain liability standards in tort law. Nonlinear pricing, such as coverage limits, arises because of dependence or common factors in the size of losses (for example, uncertain tort awards).

Also attending the conference were: Geoffrey Carliner, NBER; Richard E. Caves, Harvard University; Frank M. Gollop, Boston College; Zvi Griliches, NBER and Harvard University; Scott E. Harrington, University of South Carolina; Oliver D. Hart, Garth Saloner, and Jean Tirole, MIT; Alvin E. Klevorick, Richard C. Levin, and Ariel Pakes, NBER and Yale University; B. Peter Pashigian, University of Chicago; Robin A. Prager, Vanderbilt University; Peter C. Reiss, NBER and Stanford University; Michael H. Riordan, Boston University; and Carl Shapiro, NBER and Princeton University.

European Economic Integration

Twenty-five economists from the United States and Europe met in Cambridge on August 3-4 for a conference on "European Economic Integration: Towards 1992" sponsored by the NBER and the Centre for Economic Policy Research (CEPR). Willem H. Buiter, of NBER, Yale University, and CEPR, organized the following program:

Jeffrey D. Sachs, NBER and Harvard University; and Xavier Sala-i-Martin, Harvard University, "Federal Fiscal Policy and Currency Unions: Some Lessons for Europe from the United States"

Discussant: Willem H. Buiter

Francesco Giavazzi, NBER, University of Bologna, and CEPR; and Marco Pagano, University of Naples and CEPR, "Confidence Crises and Public Debt Management"

Discussant: Kenneth Kletzer, Yale University

Clas Wihlborg, Gothenburg University and University of Southern California, "Exchange Rate Arrangements for the Transition to a Common Currency" (jointly with Thomas Willett, University of Southern California)

Discussant: Vittorio U. Grilli, NBER, Yale University, and CEPR

Richard E. Baldwin, NBER and Columbia University, "On the Growth Effects of 1992" (This paper is described in "International Seminar on Macroeconomics.")

Discussant: David Ulph, University of Bristol and CEPR

Rick van der Ploeg, Center for Economic Research, Tilburg University, and CEPR, "Fiscal Aspects of Monetary Integration in Europe"

Discussant: Silvio Borner, University of Basel

Damien J. Neven, INSEAD and CEPR, "European Integration and Trade Flows" (jointly with Lars-Hendrik Roller, INSEAD)

Discussant: Alan Winters, University College of North Wales and CEPR

Vittorio U. Grilli and Nouriel Roubini, NBER and Yale University, "Financial Integration, Liquidity, and Exchange Rates"

Discussant: Lars E. O. Svensson, NBER and University of Stockholm

Sachs and Sala-i-Martin discuss the role of a federal fiscal government in a monetary union. They argue that a monetary union is more likely to survive if it is accompanied by a federal government that redistributes income from positively to adversely shocked regions so as to make nominal exchange rate adjustments less necessary. They find that, within the United States, a one dollar negative shock to the average U.S. region triggers higher federal transfers (between 6 and 10 cents) and lower federal taxes (between 28 and 30 cents), so the decrease in disposable income is only about 62 to 65 cents. Hence, more than one-third of the shock is absorbed by the federal government and most of the action comes from the tax side. They suggest that, without a fiscal union, a European Monetary Union (EMU) is not likely to survive.

Giavazzi and Pagano argue that under free capital mobility, confidence crises can result in devaluations if fiscal authorities can obtain temporary money financing, even when fixed exchange rates are viable. During a crisis, domestic interest rates increase, reflecting the expected devaluation. Rather than selling debt at punitive rates, fiscal authorities may turn to temporary money financing, leading to equilibriums with positive probability of devaluation. These equilibriums can be ruled out if the amount of debt maturing during the crisis is sufficiently small: a condition that can be met by reducing the stock of public debt, lengthening its average maturity, and/or smoothing the time distribution of maturing issues.

Wihlborg analyzes the transition from the current "fixed but adjustable" exchange rate system among most members of the European Community (EC) to an irrevocably fixed system within which a common currency gradually would be substituted for the old national currencies. Wihlborg argues that basic conflicts between short-run political goals and economic efficiency are likely to arise during any attempted transition. Strategies that provide the greatest short-term

benefits to national governments therefore may not provide the most efficient path for securing the longer-run objective of monetary union. Ironically, the possibility exists that, the more closely the economies moving toward monetary union meet some of the criteria for an optimal currency area emphasized in the traditional literature, the greater is the likely conflict between short-run political incentives and efficient paths toward full monetary union.

Van der Ploeg uses a two-country model to analyze fiscal aspects of monetary integration in Europe. When an adverse supply shock hits a two-country Mundell-Fleming world, it causes unemployment and a rise in the cost of living. He compares the optimal fiscal policies under international policy coordination with those pursued in the absence of international coordination. Van der Ploeg considers three exchange rate regimes: freely floating rates; managed exchange rates with hegemony (such as the European Monetary System [EMS]); and a symmetric regime of fixed exchange rates (like certain versions of the proposed EMU). He also considers the effects of comprehensive economic integration (1992), of indexation of wages to the cost of living, and of interactions and spillovers between Europe and the United States.

Neven studies intra-European trade flows and trade between Europe and the rest of the world for 29 manufacturing sectors over 1975–85. Contrary to some claims, European integration has not slowed down in recent years. Rather, European integration has proceeded alongside integration with the rest of the world. Neven finds evidence of significant unexhausted scale economies in European industry. Nontariff barriers to trade hamper trade between Europe and the rest of the world significantly more than they hamper intra-European trade.

Grilli and Roubini ask two questions suggested by the EC's decision to liberalize capital movements by 1990. First, will capital liberalization make it harder to maintain fixed exchange rate parities in the EMS area? Second, given the existence of large budget deficits and high public debt-GDP ratios in a number of EMS countries, will capital liberalization (together with the need to maintain fixed parities) make the financing and management of public debt more difficult? Using a model that has "cash-in-advance constraints" for transactions in financial markets as well as for transactions in goods markets, they find that capital controls (in the form of taxes on foreign asset acquisitions) tend to appreciate the currency in the country imposing the controls. That is because the controls reduce the share of foreign money used for asset transactions and thus increase the share used for goods transactions. Also, a move by a country toward a longer maturity structure of the public debt will tend to depreciate that country's currency by reducing the share of the country's money used for asset transactions. Countries that are simultaneously liberalizing capital movements and lengthening the maturity structure of their public debt therefore may expect to face a weakening of their currency.

Finally, even when the monetary and real "fundamentals" are not subject to uncertainty, uncertainty about the process governing public debt issues can lead to volatility of nominal and real exchange rates. This increases the burden put on monetary policies in the pursuit of exchange rate stability.

U.S./Japan Conference on Aging

The National Bureau of Economic Research and the Japan Center for Economic Research jointly sponsored a conference on "The Economics of Aging" in Tokyo on September 8 and 9. The program was:

Laurence J. Kotlikoff, NBER and Boston University, "Some Macroeconomic Implications of Aging Populations"

Discussant: Yasushi Iwamoto, Osaka University

Yukio Noguchi, Hitotsubashi University, "Macroeconomic Implications of Population Aging"

Discussant: James H. Stock, NBER and Harvard University

Michael D. Hurd, NBER and State University of New York at Stony Brook, "The Economic Status of the Elderly in the United States"

Discussant: Toshiaki Tachibanaki, Kyoto University

Noriyuki Takayama, Hitotsubashi University, "Household Asset and Wealth Holdings in Japan"

Discussant: Michael D. Hurd

Daniel McFadden, NBER and MIT, "Problems of Housing the Elderly in the United States"

Discussant: Miki Seko, Nihon University

Seiritsu Ogura, Saitama University, "Cost of Aging: Public Finance Perspective for Japan"

Discussant: Laurence J. Kotlikoff

Alan M. Garber, NBER and Stanford University, "Financing Health Care for Elderly Americans in the 1990s"

Discussant: Hiroo Urushi, Sophia University

Shuzo Nishimura, Kyoto University, "Health Care Demand by the Elderly in the Japanese Growing Economy"

Discussant: Martin Feldstein, NBER and Harvard University

Robin Lumsdaine, Harvard University, and David A. Wise, NBER and Harvard University, "Aging and Labor Force Participation: A Review of Trends and Explanations"

Discussant: Haruo Shimada, Keio University

Atsushi Seike, Keio University, "The Effect of the Employee Pension on the Labor Supply of the Japanese Elderly"

Discussant: Edward P. Lazear, NBER and University of Chicago

Kotlikoff suggests that declining saving rates over the first half of the next century will be associated with higher real wage rates and more capital per worker. These increased real wages will help to absorb the significant cost of projected increases in Social Security tax rates.

Noguchi predicts that the aging of the Japanese population, which is occurring much more rapidly than the aging of the U.S. population, will lead to reduced saving in Japan. Indeed, he suggests that Japan might become a capital-importing country in the next century. Noguchi argues that over the next two decades the Japanese government should expand investment in housing and urban infrastructure; after that, it will be difficult to allocate sufficient resources for that investment because of the shortage of national saving. He further suggests that an increase in Japanese domestic spending is desirable for international harmony. Both Kotlikoff and Noguchi emphasize that their results are sensitive to model specification. Current estimates of the effect of aging on national saving vary widely, they acknowledge.

Hurd reports that the elderly in the United States are at least as well off, and possibly substantially better off, than the nonelderly. In addition, they are well protected from inflation because much of their income, including Social Security, is indexed. In the relatively near future, the economic status of the elderly who are currently retired seems well assured, according to Hurd. However, in the more distant future, when the baby-boom generation retires and there are many more retirees per employed person, the consumption of the elderly relative to the consumption of employed persons will be lower than it is today.

Takayama finds that the elderly in Japan are wealthier than the working-age population. Because of the recent rapid rise in Japanese land prices, the difference between the wealth of the old and the wealth of the young has widened. As in the United States, equity in housing is the major asset of most elderly households. Under current circumstances, Takayama emphasizes, a young person who works all his life will be unable to buy a home in a Tokyo suburb if he has to depend on his own earnings. Takayama also points to the need of older Japanese to liquidate home assets by using equity conversion schemes, such as reverse annuity mortgages.

McFadden finds that the share of income spent on shelter rises with age in the United States, primarily because income falls more rapidly than payments for housing, but also because real housing prices increased substantially at the end of the 1970s. This supports the common perception that the elderly are being squeezed by housing costs. On the other hand, the pattern of

mobility among the elderly and the housing choices made when the elderly *do* move suggest no significant "bottled-up" demand for converting housing equity to income. There appear to be no major market barriers that prevent the elderly from choosing between non-liquid and liquid assets. McFadden also suggests that the baby-boom generation will face more difficult economic circumstances in retirement than the previous generation did.

Ogura discusses the implications of Japan's aging population for the cost of health care and public retirement benefits. As in the United States, public health insurance in Japan provides health care to the elderly at little or no cost to the patient. Apparently as a consequence, the per capita cost of health care for the elderly has risen sharply in recent years. Nonetheless, health care in Japan costs only about 6 percent of GNP, approximately half of the cost in the United States. In 1973, benefits under the Japanese public pension plans were increased substantially, and subsequent costs increased very rapidly. According to Ogura's analysis, the cost of both health insurance and pension plans will continue to increase sharply in the next several decades and will peak around the year 2021, when the cost of government medical programs will be about 50 percent higher than it is today and the cost of public pension plans will double. Together, the two plans will absorb about one-quarter of national income, about ten percentage points more than the current cost. Ogura questions whether future generations of workers will be willing to continue to support the elderly at the levels that they have been supported in the recent past.

Garber surveys demographic trends that influence the utilization of health care in the United States and examines the key financial issues surrounding hospital and physicians' services for the elderly. He also discusses the obstacles to improved financing and delivery of long-term care. Garber argues that marketing long-term care insurance to younger persons should help to prevent the adverse selection that mitigates against selling long-term care insurance to elderly persons. Nonetheless, because of the open-ended nature of potential long-term care services, moral hazard will remain an obstacle to the efficient functioning of a long-term care insurance market. As larger numbers of people purchase long-term care insurance, nursing homes are likely to change, providing high-quality housing and related services, Garber emphasizes. Many individuals who would not consider entering a nursing home today would be willing to do so if quality improved in this sense. Garber concludes that the development of private financing mechanisms is likely to be the major response to the need for long-term care.

Nishimura emphasizes the increase in health care expenditure since 1973 in Japan. He suggests that this is caused in large part by the very low cost of health care under government health insurance plans. He shows that since 1973 per capita health care expenditures for the elderly have risen much more rapidly than per capita expenditures for the population as a whole.

Lumsdaine and Wise summarize trends in the labor force participation of older Americans. They show that the labor force participation rates of men 60 and older remained essentially constant from 1870 through 1937, but then began to decline and are still falling. Lumsdaine and Wise attribute that decline to the introduction of Social Security and private pension plans, which provide most of the support for the majority of retirees; most older Americans have very little personal saving. Personal wealth is primarily in the form of housing equity, which tends not to be converted to liquid assets as the elderly age. Both the provisions of Social Security and firm pension plans and the income from them tend to encourage early retirement. Although persons are living longer and longer, they are leaving the labor force at younger and younger ages. The trend is unrelated to personal saving but rather is associated with government promises of Social Security benefits after retirement and the saving by employers for their employees through firm pension plans.

Seike studies the effect of government pensions on the labor supply of older Japanese. Labor force participation of both older Japanese and older Americans is declining. Still, Japanese labor force participation rates are about twice as high as comparable U.S. rates. For men over 65, for example, the participation rate is 37 percent in Japan compared with 17 percent in the United States. Seike shows that the government pension plan for employees contributes significantly to withdrawal of older employees from the labor force. The lump-sum tax imposed by the earnings test in Japan, similar to the U.S. Social Security earnings test, substantially reduces the labor supply of those who are receiving retirement benefits.

In summary, the Japanese and the American papers revealed striking similarities between the two countries. The populations in both countries are aging rapidly, although the rate is faster in Japan than in the United States. Workers are leaving the labor force at younger ages in both countries, although the trend is much more pronounced in the United States than in Japan. In both countries, earlier retirement may be attributed in large part to public and private pension benefits. Public health insurance that provides health care at little or no cost to patients contributed to rapid increases in costs of health care in both countries, although the per capita cost in Japan is still only half of the U.S. per capita health care cost. Housing equity is the primary asset of both elderly Americans and elderly Japanese. In both countries, the elderly are at least as well off as younger members of the population. Although Japan's national saving rate is much higher than the U.S. rate, both Japanese and American authors predict that population aging will reduce future saving rates in both countries. The cost of health care and, more generally, the prospect of a smaller proportion of employed persons supporting an expanding proportion of retired persons are important concerns in both countries.

Economic Growth

The NBER held a Conference on Economic Growth in Cambridge on October 6–7. Robert J. Barro, NBER and Harvard University, and Paul M. Romer, NBER and University of Chicago, organized the following program:

Jess Benhabib and Boyan Jovanovic, New York University, "Externalities and Growth Accounting"
Discussant: Stanley Fischer, NBER, MIT, and World Bank

Robert J. Barro, and Xavier Sala-i-Martin, Harvard University, "Economic Growth and Convergence across the United States"
Discussant: Anne O. Krueger, NBER and Duke University

Dale W. Jorgenson, Harvard University, and Peter J. Wilcoxon, University of Melbourne, "Environmental Regulation and U.S. Economic Growth"
Discussant: Timothy J. Kehoe, Federal Reserve Bank of Minneapolis

Ricardo J. Caballero, Columbia University, and Richard Lyons, NBER and Columbia University, "The Role of External Economies in U.S. Manufacturing" (NBER Working Paper No. 3033) (This paper is summarized in "Studies of Firms and Industries" in this issue.)

Discussant: Kevin M. Murphy, NBER and University of Chicago

Philippe Aghion, MIT, and Peter Howitt, University of Western Ontario, "A Model of Growth through Creative Destruction"

Discussant: Nancy Stokey, Northwestern University
Sebastian Edwards, NBER and University of California at Los Angeles, "Openness, Outward Orientation, Trade Liberalization, and Economic Performance in Developing Countries" (NBER Working Paper No. 2908)

Discussant: Rudiger W. Dornbusch, NBER and MIT
Jeremy Greenwood, Federal Reserve Bank of Minneapolis, and Boyan Jovanovic, "Financial Development, Growth, and the Distribution of Income"
Discussant: Kenneth S. Rogoff, NBER and University of California at Berkeley

Using quarterly and annual postwar U.S. aggregate data on the growth of output, labor, and capital, Benhabib and Jovanovic find no evidence of increasing returns to scale in the aggregate production function, or of a large positive externality on the capital input. This agrees with the findings of most others who look at the microdata on R and D expenditures. They also examine inputs and output over longer periods. They find that the simultaneity problems caused by the correlation between the inputs and the production function disturbance persist in long-run averages of growth rates. The puzzle that the macrodata present, then, is not that externalities are very large but that we need not appeal

to externalities at all to understand long-run movements in aggregates.

Do poor countries tend to grow faster than rich ones, so that income and production levels converge over time? Barro and Sala-i-Martin find substantial indications of convergence among the 48 contiguous states: poor states tend to grow faster than rich ones. However, the authors also find that the variance of income across states has not declined over time.

The rate of U.S. economic growth fell sharply in the 1970s and has remained low throughout the 1980s. One factor often held responsible is the increase in environmental regulation. Jorgenson and Wilcoxon analyze the economic impact of pollution controls by simulating the growth of the U.S. economy with and without regulation. They construct a model of the economy that includes the determinants of long-term growth and find that environmental regulation has been an important contributor to the growth slowdown. They also find that the cost of emission controls is more than 10 percent of the total cost of government purchases of goods and services.

Aghion and Howitt present a model in which economic growth results exclusively from technological progress, which in turn is the result of innovations produced by competitive research firms. Each innovation consists of a new line of intermediate goods that can be used to produce final output more efficiently than before. Research firms are motivated by the prospect of monopoly rents. Those rents will be destroyed by the next innovation, which will render obsolete the existing line of intermediate goods. In the model there is an equilibrium with a constant allocation of labor between research and manufacturing. Aghion and Howitt show that laissez-faire may produce too much or too little research and that cyclical equilibriums are possible.

Edwards asks how trade regimes determine economic performance and growth in developing countries. He argues that a key limitation of previous work has been its inability to create measures of trade orientation that are objective, continuous, and comparable across countries. Edwards develops a growth model that relates trade orientation to the ability to absorb technological progress from the rest of the world. He tests the model using a new index of trade orientation that is free of earlier limitations. Edwards finds that countries with a less distorted external sector grow faster than countries with a more distorted external sector.

Greenwood and Jovanovic present a model in which both the extent of financial intermediation and the rate of economic growth are determined endogenously. Financial intermediation promotes growth because it allows a higher rate of return to be earned on capital. Growth in turn provides the means to implement costly financial structures. Thus, financial intermediation and economic growth are inextricably linked. The model also generates a development cycle: in the transition from a primitive, slow-growing economy to a developed, fast-growing one, a nation passes through a stage in

which the distribution of wealth across the rich and poor widens.

Also attending the conference were: Costas Azariadis, University of Pennsylvania; Geoffrey Carliner, NBER; Zvi Griliches, NBER and Harvard University; Larry E. Jones and Sergio Rebelo, Northwestern University; Nathaniel H. Leff, Columbia University; Glenn McDonald, University of Western Ontario; Rodolfo E. Manuelli, Stanford University; Ariel Pakes, NBER and Yale University; Edward C. Prescott, Federal Reserve Bank of Minneapolis; Andrei Shleifer, NBER and University of Chicago; and Kenneth L. Sokoloff, NBER and University of California at Los Angeles.

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 1989/90 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.

- December 4, 1989**
Program Meeting: Productivity, NBER
- December 4-5, 1989**
Environmental Challenge: The Energy Response, Royal Institute of International Affairs*
- December 8-9, 1989**
Universities Research Conference: Labor Markets in the 1990s, NBER
- December 8-10, 1989**
General Equilibrium Theory, Conference on Econometrics and Mathematical Economics
- December 14-15, 1989**
Panel on Economic Activity: Microeconomics, Brookings Institution
- December 15-16, 1989**
Program Meeting: International Studies: "International Competitiveness," NBER
- December 28-30, 1989**
Annual Meeting, American Economic Association*
- December 28-30, 1989**
North American Winter Meeting, Econometric Society*
- January 4-6, 1990**
Mismatch and Labor Mobility, Center for Economic Policy Research
- January 4-6, 1990**
1990 Special International Conference, International Association for Energy Economics*
- January 4-6, 1990**
Winter Conference, American Statistical Association*
- January 7-8, 1990**
Conference on Corporate Finance, NBER, Tokyo Center for Economic Research, and Center for Economic Policy Research
- January 22-23, 1990**
European Financial Integration, Center for Economic Policy Research
- February 2, 1990**
Program Meeting: Economic Fluctuations, NBER
- February 2-3, 1990**
Political Economy, NBER
- February 9-10, 1990**
Firms and Industries, NBER
- February 27-28, 1990**
Policy Seminar, National Association of Business Economists*
- March 1, 1990**
The Impact of 1992 on European Trade and Industry, Center for Economic Policy Research
- March 2, 1990**
Higher Education, NBER
- March 9-10, 1990**
5th Annual Macroeconomics Conference, NBER
- March 16-17, 1990**
Conference on Trade, NBER
- March 16-17, 1990**
3rd Annual InterAmerican Seminar on Economics, NBER
- March 17-23, 1990**
International Atlantic Economic Conference, Atlantic Economic Association*
- March 22-24, 1990**
Conference on Financial Crisis, NBER
- March 29-31, 1990**
Annual Meeting, Midwest Economics Association*
- April 5-6, 1990**
Panel on Economic Activity, Brookings Institution
- April 5-7, 1990**
Conference on Aging, NBER
- April 5-7, 1990**
1990 Annual Meeting, Eastern Finance Association*
- April 12-14, 1990**
Conference on Economic Growth, NBER
- April 19-20, 1990**
Program Meeting: Taxation, NBER
- April 27, 1990**
Macroeconomic History, NBER
- April 20-21, 1990**
Carnegie-Rochester Public Policy Conference, Carnegie-Mellon University—University of Rochester
- May 1, 1990**
Macroeconomic Policy and the External Constraint, Center for Economic Policy Research
- May 4-5, 1990**
Conference on Research in Income and Wealth: Measurement Issues in the Service Sector, NBER
- May 11-12, 1990**
Universities Research Conference, Financial Markets and Monetary Economics, NBER
- May 14-15, 1990**
Politics and Economics in the Eighties, NBER
- May 14-15, 1990**
Regulating International Financial Markets, Columbia (with MOF, FAIR)*
- May 18-19, 1990**
Conference on Populist Economics in Latin America, NBER
- May 21-22, 1990**
Spring Symposium, National Tax Association—Tax Institute of America*
- June 14-16, 1990**
Economic Policy in Political Equilibrium, Center for Economic Policy Research

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

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

June 19–21, 1990
1990 12th Annual International Conference, International Association
for Energy Economics*

June 28–30, 1990
1990 Meetings, Society for Economic Dynamics and Control*

June 29–July 3, 1990
65th Annual International Conference, Western Economic Association*

August 6–9, 1990
Joint Statistical Meetings, American Statistical Association*

August 22–29, 1990
World Congress, Econometric Society*

August 26–30, 1990
46th Conference: Public Finance with Several Levels of Government,
International Institute of Public Finance*

September 13–14, 1990
Panel on Economic Activity, Brookings Institution

September 23–26, 1990
Annual Meeting, National Association of Business Economists*

October 18–20, 1990
Annual Research Conference, Association for Public Policy Analysis
and Management*

October 18–21, 1990
Conference on American Economic Policy, NBER

November 11–14, 1990
83rd Annual Conference on Taxation, National Tax Association–
Tax Institute of America*

November 18–20, 1990
Annual Meeting, Southern Economic Association*

December 28–30, 1990
Annual Meeting, American Economic Association*

January 4, 1991
US/Japan Housing Markets, NBER

March 21–24, 1991
Conference on Economic Crisis, NBER

April 4–6, 1991
Annual Meeting, Midwest Economic Association*

August 19–22, 1991
Joint Statistical Meetings, American Statistical Association*

August 25–29, 1991
47th Conference, International Institute of Public Finance*

September 22–25, 1991
Annual Meeting, National Association of Business Economists*

October 11–14, 1991
International Atlantic Economic Conference, Atlantic Economic
Society*

November 24–26, 1991
Annual Meeting, Southern Economic Association*

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

Bureau News

Bureau Mourns Fabricant

NBER Research Associate Emeritus Solomon Fabricant died on September 13, two days before his 83rd birthday. He had been involved with the Bureau throughout his career as an economist and he will be sorely missed.

Fabricant was born in Brooklyn in 1906. He received his bachelor's degrees from City College and New York University (NYU) and worked as an accountant from 1925 to 1929. In 1930 he received a master's degree from Columbia University and joined the NBER staff. He received a Ph.D. from Columbia in 1938.

Fabricant began his teaching career at NYU as a lecturer in 1946. He became an associate professor in 1947 and a full professor in 1948. Fabricant also served as the Bureau's research director from 1953 to 1965. He joined the NBER's Board of Directors in 1955 and became a director emeritus in 1981.

Fabricant's first Bureau publication, "Recent Corporate Profits in the United States," appeared in 1934. Over the next 50 years, he produced a steady stream of research on a wide variety of topics, including manufacturing output and employment, business cycles, savings, government employment, and productivity change. His last Bureau publication was a brief history, entitled "Toward a Firmer Basis of Economic Policy: The Founding of the National Bureau of Economic Research."

1989–90 Olin Fellows

The four Olin Fellows for 1989–90 are: Alberto Alesina, Alan B. Krueger, Karen Lewis, and David Scharfstein. The Fellows Program is made possible by a grant from the John M. Olin Foundation.

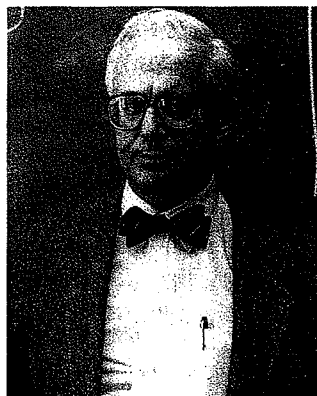
Alesina is on leave from Harvard University; his research will examine the interaction of politics and economics in formulating fiscal and monetary policy. Krueger, who comes to the NBER from Princeton University, will study various aspects of the U.S. labor market. Lewis, who is on the faculty of New York University's Graduate School of Business Administration, will investigate the fluctuations in exchange rate and asset markets. Scharfstein, of MIT's Sloan School of Management, will analyze the relationship between corporate financial structure and investment.

New Directors Named

The NBER's Board of Directors elected six new members at its September meeting: Jagdish Bhagwati, representing Columbia University; Franklin Fisher, MIT; Gail Fosler, The Conference Board; Ronald Gallant, American Statistical Association; Craig Swan, University of Minnesota; and Michael Yoshino, Harvard University.



Jagdish Bhagwati



Franklin Fisher

Bhagwati has been the Arthur Lehman Professor of Economics at Columbia since 1981, and a professor of political science there since 1986. He studied at Bombay University and Oxford University, received his M.A. from Cambridge University, and has a Ph.D. from MIT. He taught economics at MIT from 1968-80.

Fisher, an NBER research associate since 1980, has taught economics at MIT since 1960. He received his A.B., M.A., and Ph.D. degrees from Harvard University. Fisher was the 1973 winner of the John Bates Clark Award of the American Economic Association.

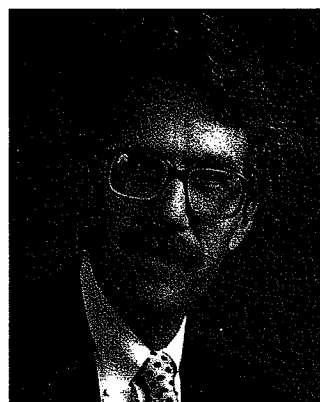
Fosler is chief economist and executive director of the economics program at the Conference Board. Previously, she was the chief economist and deputy staff director for the Senate Budget Committee, acting as principal economic advisor to Senator Pete Domenici. Fosler has a B.A. from the University of Southern California and an M.B.A. from New York University.



Gail Fosler



Ronald Gallant



Craig Swan



Michael Yoshino

Gallant is a professor of statistics and economics at North Carolina State University and an adjunct professor of economics at Duke University. He also has taught at Northwestern University and the University of Chicago. Gallant received his A.B. from San Diego State University, his M.B.A. from the University of California at Los Angeles, and his Ph.D. from Iowa State University.

Swan is an associate dean and executive officer at the University of Minnesota, where he has taught since 1969. He holds a B.A. from the University of California at Berkeley, and an M.A. and Ph.D. from Yale University. Swan was president of the Minnesota Economics Association in 1985-6.

Yoshino is a professor of business administration and a director of research at the Harvard Business School. He has also taught at the University of California and has done research at Stanford University. Yoshino received his M.B.A. at Columbia University and his Ph.D. from Stanford.

1989 Summer Institute

Over 600 economists from 58 universities and organizations around the world attended the NBER's Eleventh 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. There were 31 separate workshops on topics including international taxation, corporate finance, asset pricing models, credit market failures, unemployment, higher education, international macroeconomics, aging, and state and local government finance. A catalog of all papers and work in progress discussed at the Summer Institute can be obtained by writing to: Summer Institute Catalog, NBER, 1050 Massachusetts Avenue, Cambridge, MA 02138.

1989-90 Research Associates

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Timothy F. Bresnahan	Francesco Giavazzi	Edward P. Lazear	Richard Portes	Marie C. Thursby
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Michael Bruno	Fred Goldman	John B. Legler	Edward C. Prescott	T. James Trussell
Willem H. Buiter	Robert J. Gordon	Bruce N. Lehmann	Samuel H. Preston	Steven R. Turnovsky
Jeremy I. Bulow	Roger Hall Gordon	Jonathan S. Leonard	Ingmar R. Prucha	Steven F. Venti
John Y. Campbell	John W. Graham III	Richard M. Levich	Robert H. Rasche	Robert W. Vishny
David Card	Alan G. Green	Richard C. Levin	Assaf Razin	Paul Wachtel
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Charles T. Clotfelter	Herschel I. Grossman	Robert E. Lucas, Jr.	Sherwin Rosen	Roger N. Waud
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Rudiger W. Dornbusch	Fumio Hayashi			

NBER Associate Assumes Treasury Post

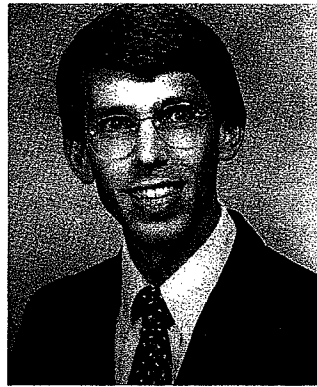
Research Associate Harvey S. Rosen, a member of the NBER's Program in Taxation since 1978, was recently named deputy assistant secretary for tax policy of the U.S. Department of the Treasury. Rosen was a professor of economics at Princeton University at the time of his appointment. He also has directed the NBER's Project on State and Local Government Finance since 1983.

Goldin and Poterba Named Associate Directors

James M. Poterba was recently named associate director of the NBER's Program in Taxation and Claudia Goldin was made associate director of the Bureau's Program in Development of the American Economy (DAE). Poterba is a professor of economics at MIT and a research associate in the Bureau's Programs in Taxation, Financial Markets and Monetary Economics, Productivity, and Aging. Goldin is a professor of econom-



Claudia Goldin



James M. Poterba

ics at the University of Pennsylvania and has been a member of the DAE program since 1978.

The new associate directors will work closely with the program directors and are expected to succeed them after two years.

In announcing these appointments, NBER President Martin Feldstein praised the substantial record of achievements of David F. Bradford, director of the Program in Taxation, and Robert W. Fogel, director of the Program in Development of the American Economy. Feldstein noted that Bradford and Fogel are the first directors of their programs and are responsible for developing the existing programs and their research agendas.

Three Olin Fellowships Available for 1990-1: A Call for Applicants

John Olin Fellowships in Economics are designed to bring outstanding young economists to NBER's Cambridge office for a year of intensive research on important economic issues. Olin Fellows are free of all teaching and other university responsibilities. Three fellowships are available for the 1990-1 academic year.

The fellowships provide a stipend equal to one's university salary and a limited travel budget to cover moving expenses, travel connected to the research, and participation in scientific meetings. Funds are also available for research assistants, data, and computing costs.

Olin Fellows are selected from economics departments and business schools. To be eligible, you must have a Ph.D., preferably completed within the last five years. Anyone under the age of 35 is eligible. The key criteria for selection are general excellence and promise as an empirical researcher on a subject of potential national importance.

Anyone interested in applying should send a curriculum vitae, a list of publications, and a brief summary of research plans (not to exceed 1000 words) by November 27 to: Geoffrey Carliner, NBER, 1050 Massachusetts Avenue, Cambridge, MA 02138. Winners will be announced by December 15.

Asset Pricing and Financial Markets: A Call for Papers

On May 11 and 12, 1990, the National Bureau of Economic Research will hold a conference in Cambridge on Asset Pricing and Financial Markets. The program, being organized by Professor John Y. Campbell of the NBER and Princeton University, will consist of seven or eight 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 conference will include a wide range of research on the determination of financial asset prices, interpreted broadly to include short- and long-term fixed-income securities, equities, foreign currencies, commodities, real estate, futures, and options. Papers presented at the conference might try to explain any of the following empirical phenomena: the cross-sectional pattern of mean returns on financial assets; time variation in conditional mean returns; the volatility of returns, and changes through time in volatility; the relationships between returns and the state of the macroeconomy; the relationships among returns measured over different horizons; and the volume and pattern of trade in financial assets.

Priority will be given to empirical research or theoretical work with direct empirical implications. Models with heterogeneous agents are of special interest.

Papers will be selected on the basis of abstracts of about 500 words or, when possible, completed papers, with preference given to papers by younger members of the profession. Any research not published at the time of the conference may be submitted. The deadline for submission of abstracts and papers is January 19, 1990. Authors chosen to present papers will be notified by February 23, 1990. The NBER will pay expenses of those chosen to give papers at the conference.

Abstracts should be sent to Professor John Y. Campbell, National Bureau of Economic Research, 1050 Massachusetts Avenue, Cambridge, MA 02138.

Economic Fluctuations Research Meeting

Over 100 economists attended a research meeting of the NBER's Program in Economic Fluctuations in Cam-

bridge on July 13. The program, organized by Research Associates Andrei Shleifer of the University of Chicago and Lawrence H. Summers of Harvard University, was:

Robert B. Barsky, NBER and University of Michigan, and J. Bradford De Long, NBER and Harvard University, "Why Have Stock Prices Fluctuated?"

Discussant: John Y. Campbell, NBER and Princeton University

Knut Anton Mork, Vanderbilt University, and Hans Terje Mysen and Oystein Olsen, Central Bureau of Statistics, Norway, "Macroeconomic Responses to Oil Price Increases and Decreases in Six OECD Countries"

Discussant: James Hamilton, University of Virginia

Lawrence M. Ausubel, Northwestern University, "The Failure of Competition in the Credit Card Market"

Discussant: Julio J. Rotemberg, NBER and MIT

Lawrence H. Summers, and Chris Carroll, MIT, "Consumption Growth Parallels Income Growth: Some New Evidence"

Discussant: Angus Deaton, NBER and Princeton University

Steve J. Davis, University of Chicago, and John C. Haltiwanger, University of Maryland, "Gross Job Creation, Gross Job Destruction, and Employment Reallocation"

Discussant: Lawrence J. Katz, NBER and Harvard University

Finn E. Kydland, Carnegie-Mellon University, and Edward C. Prescott, University of Minnesota, "Cyclical Movements of the Labor Input and Its Real Wage"

Discussant: Kevin M. Murphy, NBER and University of Chicago

Barsky and De Long reassess the relationship between stock prices and current and expected future dividends to determine whether market fluctuations are caused by shifts in fundamentals. Using data on dividends from 1900 to the present, they find that changes in the rationally expected growth rate of dividends may account for the sizable long-run variation in the dividend/price ratio. Movements in current and expected future dividends themselves also can explain much about the major historical long swings in stock prices. Previous conclusions to the contrary appear to depend on agents' assumed knowledge of certain features of the dividend process, but that knowledge was unavailable to investors at the time, Barsky and De Long believe.

Mork, Mysen, and Olsen analyze the correlations between oil price movements and GNP/GDP fluctuations for the United States, Canada, West Germany, Japan, the United Kingdom, and Norway. They find the clearest correlations for the United States, which

also shows evidence of asymmetric responses to price increases and decreases. West Germany, Canada, and Norway show significant univariate, but not multivariate, correlations with oil price increases.

The bank credit card market, containing 4000 firms and lacking regulatory barriers, appears to be an example of perfect competition. Nevertheless, Ausubel reports that credit card interest rates have been exceptionally sticky relative to the cost of funds. Moreover, credit card issuers appear to have earned three to five times the ordinary rate of return in banking from 1983-7. The competitive model may fail partly because of consumer search or switch costs, which may be exacerbated by adverse selection.

Summers and Carroll argue that the versions of the permanent-income and life-cycle theories that recently have become fashionable are inconsistent with the most obvious features of cross-country and cross-sectional data on consumption and income. Consumption and income growth are much more closely linked than these theories would predict. Furthermore, consumption smoothing appears to take place over periods of several years, not several decades. Thus the usefulness of standard representative consumer approaches to the analysis of saving behavior is questionable. Increased emphasis on liquidity constraints and short-run precautionary saving may be necessary to explain consumption behavior.

Davis and Haltiwanger measure the heterogeneity of employment changes in the U.S. manufacturing sector at the establishment level from 1972-86. Their dataset has approximately 860,000 annual observations and 3.4 million quarterly observations on 160,000 manufacturing establishments. Based on March-to-March changes in establishment level employment, gross job reallocation (that is, job creation minus job destruction) averages 20 percent per year. Reallocation rates range from 17 to 23 percent per year in the manufacturing sector, Davis and Haltiwanger find. Virtually all of the time-series variation in gross job reallocation is explained by time-series variation in the idiosyncratic components of establishment growth rates. They conclude that the intensity of shifts in the pattern of employment opportunities across establishments is strongly countercyclical. This finding provides evidence of a systematic connection between aggregate fluctuations and the heterogeneity of employment changes at the establishment level.

Using data for 1969-82 on almost 5000 people in the Panel Study of Income Dynamics, Kydland and Prescott ask if aggregate hours worked are a good measure of labor input over a business cycle. The validity of aggregate hours as a cyclical measure requires that the composition of the work force by skill and ability remain approximately unchanged over the cycle. However, aggregate hours are more volatile cyclically than labor input is. Furthermore, the real wage is strongly procyclical, while average compensation per hour is not. Thus, aggregate hours are a poor measure of labor input.

Reprints Available

The following NBER Reprints, intended for nonprofit education and research purposes, are now available. (Previous issues of the *NBER Reporter* list titles 1-1192 and contain abstracts of the Working Papers cited below.)

These reprints are free of charge to corporate associates and other sponsors of the National Bureau. For all others there is a charge of \$2.00 per reprint to defray the costs of production, postage, and handling. 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.

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