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NBER *Reporter*

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Program Report

Asset Pricing

John Y. Campbell

The NBER established its Program in Asset Pricing in the fall of 1991. This program, together with those in monetary economics and corporate finance, grew out of the earlier financial markets and monetary economics program, and has close links with the Program in International Finance and Macroeconomics. Asset pricing is the study of markets for financial assets, including stocks, bonds, foreign currencies, and derivative securities, such as futures and options. It is a highly technical field of economics, but also one in which new ideas are applied rapidly by practitioners, who take a keen interest in academic research. NBER economists have been studying a variety of topics within the field, including general equilibrium asset pricing models, international financial integration, derivative securities, and some intriguing microeconomic puzzles about asset price behavior.

Asset Pricing in General Equilibrium

One fundamental insight of modern financial theory is that a "stochastic discount factor" exists that can be used to calculate the expected return and price of any asset, given information about the pattern of its cash flows. Without this factor, investors could make riskless profits through arbitrage operations. Different asset pricing models imply different stochastic discount factors, and some models include many stochastic discount factors that will price the assets that are traded. But any model that rules out arbitrage opportunities has at least one stochastic discount factor.

Several NBER economists have been trying to characterize the stochastic discount factor that prices the assets traded in today's world economy. John H. Cochrane and Lars P. Hansen have provided a useful general overview, showing that the stochastic discount factor must be highly volatile if it is to price U.S. equities and fixed-income securities.¹ This poses a problem, because the standard macroeconomic asset pricing model, which aggregates investors into a single "representative agent" who consumes aggregate consumption, implies that the stochastic discount factor is not very volatile when the representative agent has standard preferences and attitudes toward risk.

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One response to this problem is to explore different models of investors' preferences. Phillip A. Braun, George M. Constantinides, and Wayne E. Ferson have argued that past consumption may increase the marginal utility of today's consumption; this "habit-formation" effect greatly increases investors' risk aversion whenever consumption is close to the habit level determined by the recent past history of consumption.² Geert Bekaert, Robert J. Hodrick, and David A. Marshall have explored a model of "first-order risk aversion" in which investors are more concerned about small risks than they are in the standard model.³ Shlomo Benartzi and Richard H. Thaler have developed a heterodox psychological theory of investor behavior that implies that investors place more weight on the possibility of short-term losses than on the hope of short-term gains.⁴

Other NBER economists have argued that aggregate consumption does not adequately measure the risks borne by the investors who are active in asset markets. Cochrane has suggested that it might be better to relate asset prices to the production side of the economy rather than the consumption side, while I have developed a framework in which one can measure risks without using aggregate consumption data.⁵ The framework assumes that markets are complete so that investors can share their risks, but it is also possible that investors are more wary of risky assets because they bear uninsurable idiosyncratic risk. Philippe Weil, and John Heaton and Deborah Lucas have considered the consequences of uninsurable risk for asset pricing.⁶

It is fair to say that no consensus has been reached yet about the

right way to model the stochastic discount factor, but work in the NBER asset pricing program and elsewhere is yielding considerable insight into the problem.

International Financial Integration

One of the most important developments of the last few decades has been the integration of financial markets located in different countries. Twenty years ago it was common for financial economists to ignore foreign markets, but this practice is no longer defensible. K. C. Chan, G. Andrew Karolyi, and René M. Stulz, for example, have shown that the risk premium on a U.S. stock index is explained poorly by the variance of the stock index return (the traditional domestic measure of risk), but is explained much better by the covariance of the index with foreign stock markets.⁷ Bernard Dumas and Bruno Solnik have shown that the risk of exchange rate fluctuations is important in determining the expected returns on foreign currencies and equities.⁸

Kenneth A. Froot has demonstrated that there is a further link between currency fluctuations and stock market movements. In the short run, there is almost no correlation between exchange rate movements and local-currency returns on foreign stocks, but over several years this correlation becomes important. Froot concludes that investor horizons are important in determining the extent to which investors should hedge their foreign equity investments against currency fluctuations.⁹

In an integrated world financial market, it is natural to treat different countries' stock markets as potential investments, to be analyzed

in the same way as domestic stock portfolios. In joint work with Ferson, Campbell R. Harvey has explored the characteristics of developed-country stock markets from this perspective.¹⁰ Harvey recently has extended this work to study emerging stock markets.¹¹

Derivative Securities

An equally important transformation in the world of finance has been the growth of markets for options and other derivative securities. Because options prices are influenced importantly by the volatility of underlying security prices, options markets offer economists the opportunity to measure market expectations of future volatility. Several NBER economists have shown that implied volatilities from options markets are not optimal forecasts of future realized volatilities. Shang-Jin Wei and Jeffrey A. Frankel have argued that implied volatilities tend to vary more than rational forecasts of future volatility.¹² Jaesun Noh, Robert F. Engle, and Alex Kane have shown that one can earn profits in options markets by trading on differences between option-implied volatilities and forecast volatilities from an econometric model.¹³

Robert J. Shiller has argued that the development of new derivatives markets offers important benefits to society. In several papers and a forthcoming book, he advocates the establishment of futures markets for trading macroeconomic risks including the risks of fluctuations in house prices and components of national income.¹⁴

Some Puzzles

Scientific advances often result from efforts to resolve puzzling discrepancies between observed reality and the predictions of standard

theories. Asset pricing program members have illustrated this in several interesting papers. Zvi Bodie, Robert C. Merton, and William F. Samuelson have asked why investment advisers commonly recommend that older people should be more cautious in their investments than younger people. This advice conflicts with the standard theory, which ignores the fact that younger people can absorb risks by varying their labor supply (for example, by retiring later if their investments do poorly). Bodie, Merton, and Samuelson show that conventional investment advice can be justified if the standard theory is augmented to allow for labor supply flexibility.¹⁵

Jeremy C. Stein has asked why trading activity in the housing market tends to be more intense in rising markets than in falling markets. He points out that the significant downpayments needed to buy houses make buyer liquidity an important determinant of demand. He develops a model in which falling house prices reduce the ability of homeowners to make downpayments on new homes; this reduces transactions volume in housing markets.¹⁶

David H. Romer has asked why asset prices sometimes change dramatically in the apparent absence of any important news. He suggests that trading itself may be a source of news. He constructs a model in which each investor thinks that other investors may have good news that can justify a high price. A small downward move in the asset price then may disabuse each investor and lead to a large price decline. Romer offers this as a stylized explanation for the October 1987 market break and other similar episodes.¹⁷

Other Activities

This report has emphasized the basic research being done by members of the asset pricing program. The NBER also seeks to identify intellectually challenging questions of practical importance and to encourage work that will

answer them. Members of the asset pricing program have taken part in two meetings with these objectives: a February 1993 roundtable discussion with regulators and practitioners on the regulation of derivative securities, and a January 1994 conference, organized by Andrew W. Lo and sponsored jointly by the

NBER and the New York Stock Exchange, on "The Industrial Organization of the Securities Industry." There is no shortage of relevant questions in asset pricing, and the asset pricing program will continue to sponsor meetings and research to address them.

¹J. H. Cochrane and L. P. Hansen, "Asset Pricing Explorations for Macroeconomics," in NBER Macroeconomics Annual 1992, O. J. Blanchard and S. Fischer, eds. Cambridge: MIT Press, 1992, pp. 115-169. See also S. G. Cecchetti, P. Lam, and N. Mark, "Testing Volatility Restrictions on Intertemporal Marginal Rates of Substitution Implied by Euler Equations and Asset Returns," forthcoming in *Journal of Finance*.

²P. A. Braun, G. M. Constantinides, and W. E. Ferson, "Time Nonseparability in Aggregate Consumption: International Evidence," NBER Working Paper No. 4104, June 1992.

³G. Bekaert, R. J. Hodrick, and D. A. Marshall, "The Implications of First-Order Risk Aversion for Asset Market Risk Premiums," NBER Working Paper No. 4624, January 1994.

⁴S. Benartzi and R. H. Thaler, "Myopic Loss Aversion and the Equity Premium Puzzle," NBER Working Paper No. 4369, May 1993.

⁵J. H. Cochrane, "A Cross-Sectional Test of a Production-Based Asset Pricing Model," NBER Working Paper No. 4025, March 1992; J. Y. Campbell, "Intertemporal Asset Pricing Without Consumption Data," *American Economic Review* 83 (June 1993), pp. 487-512, and "Understanding Risk and Return," NBER Working Paper No. 4554, November 1993.

⁶P. Weil, "Equilibrium Asset Prices with Undiversifiable Labor Income Risk," NBER Working Paper No. 3975, January 1992; J. Heaton and D. Lucas, "Evaluating the Effects of Incomplete

Markets on Risk Sharing and Asset Pricing," NBER Working Paper No. 4249, January 1993.

⁷K. C. Chan, G. A. Karolyi, and R. M. Stulz, "Global Financial Markets and the Risk Premium on U.S. Equity," NBER Working Paper No. 4074, May 1992.

⁸B. Dumas and B. Solnik, "The World Price of Foreign Exchange Risk," NBER Working Paper No. 4459, September 1993. A useful review of this topic is R. M. Stulz, "International Portfolio Choice and Asset Pricing: An Integrative Survey," NBER Working Paper No. 4645, February 1994.

⁹K. A. Froot, "Currency Hedging Over Long Horizons," NBER Working Paper No. 4355, May 1993.

¹⁰W. E. Ferson and C. R. Harvey, "An Exploratory Investigation of the Fundamental Determinants of National Equity Market Returns," NBER Working Paper No. 4595, December 1993, and "Sources of Risk and Expected Returns in Global Equity Markets," NBER Working Paper No. 4622, January 1994.

¹¹C. R. Harvey, "Predictable Risk and Returns in Emerging Markets," NBER Working Paper No. 4621, January 1994, and "Conditional Asset Allocation in Emerging Markets," NBER Working Paper No. 4623, January 1994.

¹²S.-J. Wei and J. A. Frankel, "Are Option-Implied Forecasts of Exchange Rate Volatility Excessively Variable?" NBER Working Paper No. 3910, November 1991.

¹³J. Nob, R. F. Engle, and A. Kane, "A Test of Efficiency for the S&P 500 Index

Option Market Using Variance Forecasts," NBER Working Paper No. 4520, November 1993. See also D. S. Bates, "Jumps and Stochastic Volatility: Exchange Rate Processes Implicit in PHLX Deutschmark Options," NBER Working Paper No. 4596, December 1993.

¹⁴R. J. Shiller, "Measuring Asset Values for Cash Settlement in Derivative Markets: Hedonic Repeated Measures Indices and Perpetual Futures," *Journal of Finance* 48 (July 1993), pp. 911-931, "Aggregate Income Risks and Hedging Mechanisms," NBER Working Paper No. 4396, July 1993, and in *Macro Markets: Creating Institutions for Managing Society's Largest Economic Risks*, Oxford: Oxford University Press, 1994.

¹⁵Z. Bodie, W. F. Samuelson, and R. C. Merton, "Labor Supply Flexibility and Portfolio Choice in a Life-Cycle Model," NBER Working Paper No. 3954, January 1992.

¹⁶J. C. Stein, "Prices and Trading Volume in the Housing Market: A Model with Downpayment Effects," NBER Working Paper No. 4373, May 1993.

¹⁷D. H. Romer, "Rational Asset-Price Movements Without News," *American Economic Review* 83 (December 1993), pp. 1112-1130.



Research Summaries

Economic Reform and Modernization in Latin America

Sebastian Edwards

Latin America entered the era following World War II with great optimism. International reserves were at record levels, an incipient manufacturing sector was beginning to develop vigorously, and there was an almost unlimited faith in the ability of government policies to secure growth and cure social ills. The creation of the Bretton Woods institutions generated expectations of a stable international economic environment, free of the financial and payments crises that had afflicted the region for many decades. Starting in the mid-1940s, most Latin American countries followed a development strategy based on a high degree of protectionism, government-led industrialization, and a broad involvement of the state in economic activities. For some time, it seemed that this approach was working, and that early promises of growth and prosperity would materialize, allowing the Latin American countries to gradually move into the ranks of the more advanced nations.¹

Between 1950 and 1980, Latin America grew at an annual average rate of almost 6 percent per annum, significantly faster than the industrial nations, and only marginally slower than the East Asian countries.² However, a number of disturbing developments seriously and steadily undermined the long-term sustainability of the regional strategy. First, excessive protectionism and generalized government controls encouraged rent-seeking activities, and created a very rigid

economic structure. Second, in many countries the combination of increasing burdens on public sector budgets and inefficient tax systems, and the government's reduced ability to provide social services efficiently, generated an increasing degree of inequality.³ Third, as a result of weak structures of public finance, more and more countries were forced to rely on inflationary financing as a way to bridge government expenditures and revenues. And fourth, as a consequence of the inward-looking strategy, exports were greatly discouraged, barely growing between 1960 and 1980.

After the first oil shock of 1973, the mode of development followed by Latin America became increasingly unsustainable. The aggregate current account deficit for Latin America and the Caribbean more than doubled between 1972 and 1982, rising from 2.2 percent to 5.5 percent of GDP. Moreover, the region's foreign debt/GDP ratio increased from 0.20 in 1975 to 0.46 in 1982.⁴

The debt crisis unleashed in 1982, and the failure of policies put in place in some countries to deal with it—the Austral Plan in Argentina, the Cruzado Plan in Brazil, and the APRA Plan in Peru—played an important role in reshaping policy views in Latin America.⁵ It became increasingly apparent that the high degree of reliance on the state to run the economy had not produced the expected results. Instead of *protecting* the public from major external shocks, the overexpanded state had greatly weakened the

ability of these economies to react to foreign disturbances. Politicians and policymakers began to sense—slowly at first, and then at an increasing speed—that the inward-oriented policies followed by the majority of the region were no longer sustainable. As the 1980s unfolded, economists dealing with Latin America with increasing insistence recommended a shift in the region's development strategy toward market-based policies. At the end of the 1980s, a growing number of political leaders began to adopt a new vision of economic policy based on market forces, international competition, and a greatly reduced role for the state in economic affairs. After 1989, there was an intensification and generalization of this reform process, with more and more countries opening to international trade and embarking on ambitious privatization programs. In the early 1990s, policymakers in an increasing number of countries began to supplement the modernization reforms with social programs focused on the reduction of inequality and the eradication of poverty.

Latin America's experience with adjustment and market-oriented reforms during 1982–92 has been fascinating, and has generated successes as well as failures. In many cases, the reforms are too recent to draw firm conclusions on their outcomes, but in others there is already enough evidence to provide at least an initial evaluation.⁶

I. The Debt Crisis and the Muddling-Through Period: 1982–7

The debt crisis erupted rather unexpectedly in August of 1982.⁷ Initially most analysts, including those in the multilateral institutions, argued that Latin America was fac-

ing a mere *liquidity* problem. The early years of the crisis were characterized by an *emergency* adjustment process in which countries had to improvise in an effort to rapidly generate massive resource transfers to the advanced world. During this early period, a number of countries—Argentina, Brazil, and Peru—experimented with heterodox plans that ignored the need for fiscal discipline, as a way of reducing inflation. These programs were the last massive adjustment effort based on the traditional Latin American structuralist approach to economic development. Their rapid failure ignited a deep soul-searching process among political leaders and intellectuals in the region.⁸

Since 1987–8, there has been remarkable transformation in economic thinking in Latin America. Protectionism and interventionist views have given way to openness, market orientation, and competition. There have been four main causes behind this doctrinal transformation: first, the realization that the traditional government-led development policies had failed to create a modern economic system; second, the example of the countries of East Asia, with their extremely high rates of growth; third, the fall of the nations of East Europe, and the realization that socialism had led to generalized failure and frustration; and fourth, the policies of the multilateral institutions—especially the International Monetary Fund and the World Bank—that conditioned their funds to the implementation of major reforms.⁹

This change in economic thinking resulted in a new *Latin American Consensus* that has driven the region's reforms.¹⁰ This new consensual view has come to be shared by most policymakers and analysts in the region, and is based

on four main components. First, there is a recognition that achieving macroeconomic stability is a fundamental prerequisite for achieving sustainable growth with equity. Second, the Latin economies have gone through a massive and largely unilateral process of trade liberalization. This opening process has been aimed at transforming the export sector into the region's "engine of growth." Third, a massive privatization and deregulation process aimed at increasing the role of markets, and competition in the development process, has been undertaken. The fourth component of the Latin American reforms is more recent, and deals with the social sectors and antipov-erty programs. Increasingly, policy-makers and political leaders in the Latin American countries have come to the agreement that in order to consolidate the reforms, making them a durable part of the region's economic landscape, poverty and inequality have to be addressed in an effective way. To this end, new programs targeted to the poorest sectors of society are being devised in a large number of countries.¹¹

II. An Era of Reform: 1988–93

Even though it is difficult to date exactly the beginning of the reforms in each particular country, it is possible to argue that they acquired full and generalized force only in the late 1980s and early 1990s, after the attempts to use traditional structuralist policies to solve the crisis had failed. At the time the reforms were initiated, the countries in the region experienced very different initial conditions. Some faced very rapid inflation and highly distorted incentive systems; others started from a situation of relatively mild inflation and

moderate distortions. The initial conditions also varied in terms of the economic role of the state, including the importance of state-owned enterprises.

Although the intensity and scope of the reforms have differed across countries, it is possible to classify them into four broad groups according to the approximate time of initiation of the reforms: early reformers, recent reformers, very recent reformers, and future reformers. Generally speaking, early reformers are further along in the transformation, having made progress in many areas. Chile represents a case of its own, having initiated the reforms in 1975, almost a decade before anyone else.¹² Mexico initiated the reforms in 1985 and also has moved broadly and deeply; it has built new institutions that have helped consolidate the new economic system. The recent and very recent reformers vary in the intensity and scope of reforms. Some countries, such as Argentina, have rapidly and simultaneously dealt with many sectors; others have moved selectively on structural reforms, or have been unable to enact credible macroeconomic programs.

In almost every country, the early post-debt crisis years (1982–7) resulted in severe declines in GDP per capita. After 1987, GDP per capita began to recover in many of them. Interestingly enough, growth has shown a stronger trend among advanced reformers than among those countries that delayed the adjustment process.¹³ With a few exceptions, most Latin countries experienced respectable to strong growth in 1992–3.

Macroeconomic stabilization, including the reduction of the debt burden, has been at the center of the reform process. The recognition

by the advanced nations that the crisis was more than a liquidity crunch was a fundamental step in the stabilization process. In general, volunteer debt reduction agreements—the so-called Brady deals—have been undertaken after the country in question has made significant progress in reducing fiscal imbalances, curbing inflation, and achieving macroeconomic stability.¹⁴

Some questions of sequencing and speed were addressed when policymakers designed stabilization programs: for example, should macro adjustment precede the structural reforms, or can both types of policy be undertaken simultaneously? And, should gradual stabilization be attempted, or are abrupt policies more appropriate?¹⁵ In a number of countries, fixed nominal exchange rates have been used as anchors in the anti-inflationary effort. However, this has been a controversial policy. While a number of authors argued that fixing the exchange rate provided credibility to the stabilization programs, others pointed out that fixed rates contributed to real exchange rate overvaluation during the transition toward low inflation, undermining the sustainability of the stabilization effort.¹⁶

Trade liberalization has been at the core of the structural reforms. Import tariffs have been reduced from an average of approximately 70 percent to around 12 percent, and nontariff barriers have almost been eliminated throughout the region in a very short time. As a result, the Latin countries have experienced rapid productivity improvements and significant expansion in exports. Recently, this unilateral opening process has been supplemented by efforts toward the creation, or revitalization, of regional trading blocs—MERCOSUR, the

Andean Pact, the Central American Common Market, and CARICOM.¹⁷ Also, most countries in the region have expressed interest in joining NAFTA.¹⁸ A competitive real exchange rate—and, in particular, the avoidance of overvaluation—has played a key role in determining the success of trade reform attempts. The pressure that massive capital flows have exercised recently on real exchange rates throughout the region has been the cause of some concern among policy analysts, though.¹⁹

One of the salient features of the recent Latin reforms, and one that distinguishes them from past efforts at stabilizing and reducing the extent of distortions, is the emphasis on reducing the size of the state through massive privatization. In many countries, the privatization process has been linked to debt reduction schemes based on debt-equity swaps. As a result of this, foreign firms have played an important role in reshaping Latin America's manufacturing and financial sectors. This development constitutes a marked change from a traditional history of mistrust of foreign firms. Although the privatization process has taken different forms in different countries, it has created thousands of new share owners. Latin American policymakers have discovered that, in many cases, a modern regulatory framework is a requirement for the efficient functioning of the newly privatized sector. However, progress in this area has been uneven throughout the region.²⁰ One area in which very little improvement has occurred is labor market deregulation. In most countries, labor market duality continues to exist, and labor distortions negatively affect welfare and international competitiveness.²¹

For years, the majority of the Latin American countries strictly controlled capital markets, quantitatively allocating credit and keeping interest rates below ongoing rates of inflation.²² The deregulation of the financial sector has been an important component of most reforms. Interest rates have been freed, and the creation of new financial institutions has been encouraged. Some important policy debates in this area have dealt with the optimal timing of financial reform, the role of capital market supervision, and the opening of the capital account. In spite of the reforms of capital markets in the region, investment and savings remain low in most countries. Explaining the behavior of private savings is rapidly becoming one of the most pressing analytical issues in Latin America.

Latin America has a long tradition of poverty and inequality. Moreover, many aspects of human development have deteriorated since the eruption of the debt crisis. Now there is a general recognition in the region that economic growth and education are the main *long-run* determinants of reduced poverty. However, it takes these two channels a long time to actually change human conditions. As a result of this, many governments (and the multilateral institutions) have decided to implement programs aimed at directly and rapidly dealing with poverty and inequality. The new approach being followed in most countries contrasts acutely with traditional practices. Instead of providing "blanket" subsidies through price controls and other distortions, an effort now is being made to *directly target* subsidies to the most vulnerable segments of society.²³ It has been argued that in order to avoid a return

to populist practices, it is necessary to tackle social problems in an effective way, and to develop new institutional settings that assure stability and protect the economy from short-term and myopic political impulses. A number of authors have pointed out that this type of reform will not only help maintain the path toward growth and prosperity, but also is likely to strengthen the region's nascent democracies.²⁴

III. The Future of the Latin American Economic Reforms

In spite of marked progress, a decade after the debt crisis, the reform process is far from over in Latin America; a number of problems still persist. Physical infra-

structure has deteriorated severely, and in many countries the extent of poverty has increased. Despite some spectacular progress, inflation continues to be high. In some countries, the economic reforms have not been accompanied by institutional modernization. Additionally, large capital inflows in many countries recently have financed increasingly large current account deficits, and have generated sizable pressures toward real exchange rate appreciation. Policy reversals have been common in Latin America's history, and have often resulted in frustration and skepticism. The consolidation of the reforms appears to be the most fundamental challenge that the Latin American countries will face in the years to come.

¹For a brief discussion of the early development strategy in Latin America, see, for example, S. Edwards, "The United States and Foreign Competition in Latin America," in *The Changing Role of the United States in the World Economy*, M. Feldstein, ed. Chicago: University of Chicago Press, 1988. See also From Despair to Hope: Crisis and Reform in Latin America, S. Edwards, ed., forthcoming from Oxford University Press.

²Of course, performance varied significantly across countries. Brazil and Mexico grew particularly fast, while Chile tended to lag behind.

³See the discussion in S. Edwards, From Despair to Hope: Crisis and Reform in Latin America. See also E. Cardoso, R. Paes de Barros, and A. Urani, "Inflation and Unemployment as Determinants of Inequality in Brazil: The 1980s," in *Stabilization, Economic Reform, and Growth*, R. Dornbusch and S. Edwards, eds. Chicago: University of Chicago Press, forthcoming.

⁴The policies followed by Latin America since World War II contrasted sharply with those adopted by a group of countries in East Asia—Korea, Singapore, and Hong Kong, among others—since the mid-1960s. While the majority of the Latin American governments encouraged inward-looking growth and

underestimated the importance of macroeconomic stability, the East Asian countries implemented policies that vigorously encouraged exports and preserved macroeconomic equilibriums. Additionally, domestic savings in East Asia increased to a point where the need to rely on foreign borrowing was significantly reduced. The essays in *Developing Country Debt and Economic Performance*, Volumes 1, 2, 3, J. D. Sachs et al., eds., Chicago: University of Chicago Press, 1988–90, contain contrasting analyses of the development strategies followed by Latin American, Asian, and Middle Eastern countries.

⁵R. Dornbusch and S. Edwards, "Macroeconomics Populism," *Journal of Development Economics* 32 (1990), pp. 247–277, deals with the APRA plan in the context of populist policies. See also the essays in *The Macroeconomics of Populism in Latin America*, R. Dornbusch and S. Edwards, eds. Chicago: University of Chicago Press, 1991.

⁶One of the greatest difficulties in addressing the economic problems of Latin America is that this is a very diverse region, with countries that have as many differences as similarities. For example, Brazil, with 150 million people and great regional disparities in income and development, contrasts sharply with small and relatively homo-

geneous Costa Rica. However, in spite of the obvious individual features of each country or region, it is still possible (and useful) to analyze the recent Latin reforms from a broad and general perspective. This approach allows the extraction of general lessons that I hope will be valuable to other areas engaged in reform efforts. A second difficulty in attempting to discuss the evolution of the region as a whole refers to the low quality of much of the available data. This forces us to be cautious and, at times, to offer only preliminary conclusions.

⁷S. Edwards, "The Pricing of Bank Loans and Bonds in International Financial Markets," *European Economic Review* (June 1986), pp. 565–589, discusses the extent to which the international financial market anticipated the debt crisis. See also S. Edwards, "LDC's Foreign Borrowing and Default Risk: An Empirical Investigation," *American Economic Review* (September 1984), pp. 726–734.

⁸For a detailed discussion of the muddling-through years, see S. Edwards, "Structural Adjustment in Highly Indebted Countries," in *Developing Country Debt and Economic Performance*, Volume 1: *The International Financial System*, J. D. Sachs, ed. Chicago: University of Chicago Press, 1988. Starting in 1988 the NBER has organized an annual conference—the InterAmerican Seminar on Economics, IASE—in Latin America to discuss issues related to economic development. The early meetings of the seminar, held in Mexico City, Bogota, Rio de Janeiro, and Santiago, dealt extensively with the debt crisis. Selected papers from these conferences are published in special issues of the *Journal of Development Economics* and *El Trimestre Económico*, edited by the conference directors, E. Bacha and myself.

⁹For an evaluation of the early relationship between the IMF and the developing countries, see S. Edwards and J. Santaella, "Devaluation Controversies in Developing Countries: Lessons from the Bretton Woods Era," in *A Retrospective on the Bretton Woods System*, M. Bordo and B. Eichengreen, eds. Chicago: University of Chicago Press, 1992. For critical evaluations of the IMF role in the initial years of the debt crisis, see S. Edwards, "The International Monetary Fund and the Developing Countries: A Critical Evaluation," in *Carnegie-*

Rochester Series on Public Policy 31 (Fall 1989). On the initial evolution of Latin American thinking in the post-crisis period, see S. Edwards, "The Debt Crisis and Economic Adjustment in Latin America," *Latin American Economic Review* 24, 3 (1989).

¹⁰Some analysts have referred to this process as the "Washington Consensus," and have suggested that the new policies were imposed on Latin America by the U.S. Treasury, the IMF, and the World Bank. This interpretation is overly U.S.-centrist and clearly misses the internal Latin American political dynamics.

¹¹On the social consequences of structural reforms and labor market behavior under adjustment measures, see S. Edwards, "Economic Reform, Labor Markets, and the Social Sectors: A Latin American Perspective," Working Paper, Institute for Policy Reform, October 1993.

¹²On the Chilean reforms, see, for example, S. Edwards and A. C. Edwards, *Monetarism and Liberalization: The Chilean Experiment*, Chicago: University of Chicago Press, 1991; and "Markets and Democracy: Lessons from Chile," *The World Economy* 15 (1992).

¹³It is important to notice, however, that in spite of recent growth, only 13 countries in the region had income per capita by 1991 that exceeded that of 1980: Colombia, Chile, Paraguay, Bahamas, Barbados, Belize, Jamaica, Antigua, Dominica, St. Kitts and Nevis, St. Vincent and Grenadines, and St. Lucia.

¹⁴The recently approved Brazilian deal is a departure from this norm. For a detailed description of the evolution of the debt problem, see Chapter 4 of S. Edwards, *From Despair to Hope*, op. cit. On the use of market-based mechanisms to reduce the debt burden, see, for instance, S. Edwards, "Capital Flows, Foreign Direct Investment, and Debt-Equity Swaps in Developing Countries," in *Capital Flows in the World Economy*, H. Siebert, ed. Tübingen, Germany: J. C. B. Mohr, 1991.

¹⁵On the sequencing issue, see, for example, S. Edwards, "The Sequencing of Economic Reform: Analytical Issues and Lessons from Latin America," *The World Economy* 13 (1990); "Sequencing and Welfare: Labor Markets and Agriculture," in *Open Economies: Structural Adjustment and Agriculture*,

I. Goldin and L. A. Winters, eds. Cambridge University Press, 1992; and "The Sequencing of Structural Adjustment and Stabilization," Occasional Paper 34, International Center for Economic Growth, 1992. On the debate over the opening of the capital account, see the papers collected in *Capital Controls, Exchange Rates, and Monetary Policy in the World Economy*, S. Edwards, ed., forthcoming from Cambridge University Press.

¹⁶On this debate, see, for example, S. Edwards, "Exchange Rates as Nominal Anchors," *Weltwirtschaftliches Archiv* 129 (1993); "Exchange Rates, Inflation, and Disinflation: Latin American Experiences," NBER Working Paper No. 4320, April 1993; and M. Bruno, "High Inflation and Nominal Anchors of an Open Economy," Princeton Essays in International Finance (1991). See also S. Edwards and F. J. Losada, "Fixed Exchange Rates, Inflation, and Macroeconomic Discipline," NBER Working Paper No. 4661, February 1994. A number of recent analyses have related inflation, and the fate of stabilization policies, to political economy developments. See, for example, A. Cukierman, S. Edwards, and G. Tabellini, "Seigniorage and Political Instability," *American Economic Review* 82 (1992); S. Edwards and G. Tabellini, "Explaining Inflation and Fiscal Deficits in Developing Countries," *Journal of International Money and Finance* 10 (1991); and S. Edwards, "The Political Economy of Inflation and Stabilization in Developing Countries," *Economic Development and Cultural Change* (1994).

¹⁷On Latin America's historical integration efforts, see S. Edwards and M. A. Savastano, "Latin American Economic Integration: Evolution and Future Prospects," in *Regional Economic Integration and Trading Arrangements*, D. Greenaway, ed. New York: New York University Press, 1989, and S. Edwards, "Economic Integration in Latin America: New Perspectives on an Old Dream," *The World Economy* (1993).

¹⁸On trade reform and economic performance, see, for example, S. Edwards, "Trade Orientation, Distortions, and Growth in Developing Countries," *Journal of Development Economics* 39 (1992); "Openness, Trade Liberalization, and Growth in Developing Countries," *Journal of Economic Literature*

(September 1993); "Trade Policy, Exchange Rates, and Growth," NBER Working Paper No. 4511, October 1993; and "Trade Liberalization Reform in Latin America," *Journal of North American Trade* (Spring 1993).

¹⁹On real exchange rate overvaluation, see, for example, S. Edwards, *Exchange Rate Misalignment in Developing Countries*, Baltimore: Johns Hopkins University Press, 1988; *Real Exchange Rates, Devaluation, and Adjustment*, Cambridge: MIT Press, 1989; "Exchange Controls, Devaluations, and Real Exchange Rates: The Latin American Experience," *Economic Development and Cultural Change* (1989). On capital inflows and real exchange rates, see S. Edwards, "Tariffs, Capital Controls, and Equilibrium Real Exchange Rates," *Canadian Journal of Economics* (1989); and "Current and Capital Account Liberalization and Real Exchange Rates in Developing Countries" in *Exchange Rate Policies in Developing and Post Socialist Countries*, E. M. Claassen, ed. ICS Press, 1991.

²⁰See, for example, Chapter 6 of S. Edwards, *From Despair to Hope*, op. cit.

²¹For an analytical discussion of some of these issues, see S. Edwards, "Terms of Trade, Tariffs, and Labor Adjustment in Developing Countries," *World Bank Economic Review* (1988), and S. Edwards and A. C. Edwards, "Labor Market Distortions and Structural Adjustment in Developing Countries," NBER Working Paper No. 3346, May 1990.

²²R. McKinnon, *The Order of Economic Liberalization*, Baltimore: Johns Hopkins University Press, 1991, documents that the ratio of loanable funds to GDP in Latin America was significantly lower than that of Asia during 1960-85. See also S. Edwards, "Financial Liberalization Policies in a Multisector Framework," in *Development Strategies for the 21st Century*, T. Yamasaki, T. Mori, and H. Yamaguchi, eds. Tokyo: Institute of Developing Economies, 1992.

²³See Chapter 8 of S. Edwards, *From Despair to Hope*, op. cit.

²⁴On these issues, see, for example, the detailed discussion in Chapter 8 of S. Edwards, *From Despair to Hope*, op. cit. See also the papers in R. Dornbusch and S. Edwards, *Stabilization, Adjustment, and Growth*, op. cit.

The Role of Corporate Taxes in an Open Economy

Roger H. Gordon

The economic effects of corporate taxes, and their role in the tax structure, has been a major focus of research in public finance for many years. Until recently, however, almost all of this work has assumed that the economy is closed. Thus, the conventional view would be that the personal tax law treats savings invested in corporate equity more favorably than income from most other assets, because taxes on accruing capital gains are deferred and gains still unrealized at death are exempt from tax. The corporate tax then helps to offset this distortion to the allocation of savings by adding a supplementary tax on corporate equity. To the extent that the effective tax rate on corporate equity exceeds the rate applied to other forms of savings, capital will shift from the corporate to the noncorporate sector,¹ and corporations will have an incentive to use debt finance in order to reduce their taxable income.² The presumption since Harberger,³ however, has been that the main effect of the corporate tax is to raise the effective tax rate on savings, and that the burden of the tax falls primarily on capital owners.

During the last few years, much of my research has studied how past conclusions about the role of corporate taxes change once we take into account the fact that economies are open. While taxes on savings and investment are equivalent in a closed economy, they are completely different in a small open economy. If a small open economy uses a corporate income tax, the burden of the tax must fall on immobile factors, pre-

sumably workers and landowners. The corporate tax has no effect on the net return earned on savings, since capital owners always have the option to invest elsewhere, so they can easily escape the tax. I show that taxes on labor income and land dominate corporate taxes in a small open economy, even from the perspective of workers and landowners: under either type of tax, immobile factors bear the burden of the tax, but with labor and land taxes there are no distortions discouraging capital imports.⁴

In spite of this theory, however, essentially all developed countries have significant corporate taxes and have had them for many years. What explains this sharp contrast between theory and practice?

In a paper with Hal Varian,⁵ I examine optimal taxes in *large* open economies. Large countries certainly would want to take advantage of their market power in world capital markets. Capital-importing countries can impose a corporate tax to discourage capital imports, while offsetting this tax for domestic residents by subsidizing domestic savings. In contrast, large capital-exporting countries would want to reduce their capital exports, so they would want to subsidize domestic investment and tax domestic savings. But this forecast, that only large capital-importing countries would impose positive corporate tax rates, is certainly not consistent with the evidence.

Feldstein and Horioka report that net capital flows across countries are surprisingly small;⁶ others show that even gross capital flows are dramatically smaller than would be forecast by existing mod-

els of optimal portfolio choice.⁷ In a paper with A. Lans Bovenberg,⁸ I explore possible explanations for both sets of observations, and their implications for tax policy. We find that the only explanation for both observations is asymmetric information between countries. If investors are not well informed when investing abroad, they should do less well on average than local investors, either because they end up being overcharged for securities by local owners or because they invest real resources less well. In fact, Grubert, Goodspeed, and Swenson find that foreign subsidiaries in the United States report dramatically lower rates of return than domestic U.S. firms do, even after controlling for industry, age, and other such factors.⁹

Even though asymmetric information explains the observed immobility of capital, corporate taxes do not make sense. When asymmetric information is taken into account, capital-importing countries should subsidize foreigners to buy domestic securities: because of the "lemons" problem, too few sales occur, and the capital-importing country as a whole would gain by increasing foreign acquisitions of domestic firms. But this does not happen. While the loss of proprietary information to a foreign acquirer may impose enough extra costs on a country to discourage it from subsidizing foreign acquisitions, the theory is still incapable of explaining observed corporate tax policies.

The theories argue that each country, acting alone, would not want to tax capital income. But if countries cooperate, then they might choose jointly to impose corporate taxes. Unlike the case of tariff policy, however, there have been no documented cases of

countries agreeing on a common corporate tax policy, or even intervening to enforce some implicit agreement. However, I explore whether cooperation might occur without explicit (or even implicit) agreements.¹⁰

A number of countries, including the United States, Japan, and the United Kingdom, grant domestic residents a credit against domestic taxes due on foreign source income for any foreign taxes already paid on this income. Capital-importing countries then can tax investors from countries granting such credits (at rates up to the tax rates prevailing in these other countries) at no cost to the investors. Thus, they would certainly want to do so. Given this response of capital-importing countries, capital-exporting countries as a group could gain by jointly imposing a corporate tax. To prevent capital from simply shifting abroad, they then use crediting provisions to induce other countries to impose a tax at the same rate. When the United States was the dominant capital exporter, there was no need for cooperation among exporters. But there is no evidence of such cooperation among the sizable number of countries that are now important capital exporters.

Perhaps corporate taxes survive in an open economy because they are serving an entirely different role in the tax system. In a paper with Joel B. Slemrod,¹¹ I try to assess to what degree corporate taxes simply tax the competitive return to corporate capital. We calculate what corporate tax liabilities would be under a cash-flow tax. If corporate income simply equaled the competitive return earned by corporate capital, then a cash-flow tax would collect nothing (in present value). Shifting to a cash-flow

tax involves expensing undepreciated capital and new investment, resulting in a reduction in tax liabilities. However, under such a tax, interest deductions also would be eliminated. On net, the latter effect is larger in present value, so that a cash-flow tax collects *more* revenue than the existing tax.¹² Taken literally, this result implies that more than all of the existing tax base consists of something other than the competitive return to capital invested in the corporate sector.

This suggests that the corporate tax is not primarily a tax on the competitive return to corporate capital. But then what is being taxed by the corporate tax, and what economic implications does the tax have as a result? One possible explanation that I have explored with Jeffrey K. MacKie-Mason is that entrepreneurs easily can retain their earnings within their firms rather than pay them out as salary or bonuses.¹³ This retained income ends up being taxed as corporate profits (and unrealized capital gains on corporate equity), rather than as personal income. If entrepreneurs eventually bequeath the shares in the firm to their heirs, then the income is entirely free from personal taxes. This strategy of leaving money within the firm is advantageous for tax reasons whenever the corporate tax rate is less than the personal tax rate. The optimal policy response in a closed economy, given this possibility of shifting reported income between the corporate and the personal tax bases, is to impose a cash-flow tax on corporate income at the same rate that applies to labor income under the personal income tax. The corporate tax then serves as a backstop to the personal tax on labor income.

In an open economy, additional complications arise, in spite of the

lack of labor mobility. Firms can use transfer pricing to shift profits elsewhere when domestic tax rates are high. Domestic entrepreneurs can set up firms abroad, rather than at home, to escape domestic taxes. In response, the theory forecasts that the optimal corporate tax rate will be somewhat below the top personal tax rate, in order to lessen the use of transfer pricing. Also, taxes will be imposed on foreign earnings, for example when they are repatriated. However, the corporate tax still is needed as a backstop to personal taxes on labor income, even in an open economy. This rationale for the corporate tax is therefore much more consistent with observed tax policy.

If the threat of income shifting is so important, then there should be some clear evidence of it in response to recent changes in corporate relative to personal tax rates in the United States. In exploring this question, MacKie-Mason and I began by studying the degree to which U.S. firms have shifted between corporate and noncorporate status in response to tax differences.¹⁴ We find that firm choices do seem to respond as expected to tax incentives. For example, there has been a dramatic jump in the number of S corporations since 1986 in response to the drop in personal relative to corporate tax rates.¹⁵ But given the substantial variation in relative tax rates in recent years, the variation in the fraction of capital located in the corporate sector has been quite modest. The pressure created by this type of income shifting alone would not seem important enough to explain the stability in corporate tax policy across both time and countries.

Even within firms that remain corporate, however, the amount of income shifting that occurs could

be very responsive to tax differentials. Owner/managers of corporations have substantial control over their form of compensation, and can easily change how they are paid in response to tax incentives. Given the steady reduction in personal relative to corporate tax rates in recent years, if income shifting were important, we should have seen a significant shift in taxable income out of the corporate into the personal tax base. In fact, there have been a number of recent papers reporting evidence consistent with such a shift. Poterba and Auerbach find,¹⁶ for example, that reported before-tax rates of return in the U.S. corporate sector have been declining quite sharply in recent years. In contrast, Feenberg and Poterba find that incomes of the richest one-quarter of one percent of taxpayers grew dramatically during the same time period, and

particularly after the 1986 tax reform.¹⁷ In future research, I intend to look more carefully at the nature of these changes, to see if together they can be explained by income shifting.

One remaining puzzle concerns why existing corporate taxes attempt to include the return earned by corporate capital, given the forecasts from the theory that such taxes on capital should not exist in an open economy. While Slemrod and I find that no revenue is raised from attempts to tax the return to capital, these attempts certainly introduce many forms of distortion to the behavior of corporations. Perhaps because the efficiency cost of these distortions is small, there has not been much pressure to eliminate them. In particular, in work done partly with John D. Wilson,¹⁸ I find that even though on average

substantial taxes are paid on new investments, the certainty equivalent cost of these taxes is small. That is because the taxes imply that investors share future risks as well as future returns with the government, and because new investment (and the implied tax payments) tends to occur when the economy is doing unexpectedly well.

If the primary function of the corporate tax is indeed as a backstop to the personal tax on labor income, rather than as a tax on the return to capital invested in the corporate sector, then a very different set of behavioral responses must be taken into account when considering changes in corporate tax rates. Much work remains to be done to document the extent and the form of income shifting, and its implications for tax policy

¹A careful study documenting this reallocation is D. Fullerton, A. T. King, J. B. Shoven, and J. Whalley, "Corporate Tax Integration in the United States: A General Equilibrium Approach," *American Economic Review* (September 1981), pp. 677-691.

²For a recent assessment of the size of this distortion, see R. H. Gordon and J. K. MacKie-Mason, "Effects of the Tax Reform Act of 1986 on Corporate Financial Policy and Organizational Form," in *Do Taxes Matter? The Impact of the Tax Reform Act of 1986*, J. B. Slemrod, ed., Cambridge: MIT Press, 1991, pp. 91-131.

³A. C. Harberger, "The Incidence of the Corporate Income Tax," *Journal of Political Economy* (June 1962), pp. 215-240.

⁴R. H. Gordon, "Taxation of Investment and Savings in a World Economy," *American Economic Review* (December 1986), pp. 1086-1102.

⁵R. H. Gordon and H. R. Varian, "Taxation of Asset Income in the Presence of a World Securities Market," *Journal of International Economics* (June 1989), pp. 205-226.

⁶M. Feldstein and C. Horioka, "Domestic Savings and International Capital Flows," *The Economic Journal* 90 (1980), pp. 314-329.

⁷See, for example, M. Adler and B. Dumas, "International Portfolio Choice and Corporation Finance: A Synthesis," *Journal of Finance* 38 (1983), pp. 925-984, and K. R. French and J. M. Poterba, "Investor Diversification and International Equity Markets," NBER Working Paper No. 3609, January 1991, and *American Economic Review* (May 1991), pp. 222-226.

⁸R. H. Gordon and A. L. Bovenberg, "Why Is Capital So Immobile Internationally? Possible Explanations and Implications for Capital Income Taxation," mimeo, 1993.

⁹H. Grubert, T. Goodspeed, and D. Swenson, "Explaining the Low Taxable Income of Foreign-Controlled Companies in the United States," in *Studies in International Taxation*, R. G. Hubbard, A. Giovannini, and J. B. Slemrod, eds., Chicago: University of Chicago Press, 1993, pp. 237-270.

¹⁰R. H. Gordon, "Can Capital Income Taxes Survive in Open Economies?"

Journal of Finance (July 1992), pp. 1159-1180.

¹¹R. H. Gordon and J. B. Slemrod, "Do We Collect Any Revenue from Taxing Capital Income?" in *Tax Policy and the Economy*, Volume 2, L. H. Summers, ed., Cambridge: MIT Press, 1988, pp. 89-130.

¹²This remains true even if personal taxes on income from financial assets also were eliminated.

¹³R. H. Gordon and J. K. MacKie-Mason, "Why Is There Corporate Taxation in a Small Open Economy? The Role of Transfer Pricing and Income Shifting," in *International Taxation*, M. Feldstein, J. R. Hines, and R. G. Hubbard, eds., forthcoming from University of Chicago Press.

¹⁴R. H. Gordon and J. K. MacKie-Mason, "Taxes and the Choice of Organizational Form," NBER Working Paper No. 3781, July 1991, and "Tax Distortions to the Choice of Organizational Form," *Journal of Public Economics*, forthcoming.

¹⁵Income of S corporations is taxed as personal rather than corporate income,

but the firms otherwise share many of the legal attributes of corporations, such as limited liability.

¹⁶J. M. Poterba and A. J. Auerbach, "Why Have Corporate Tax Revenues Declined?" in *Tax Policy and the Economy*, Volume 1, L. H. Summers, ed., Cambridge: MIT Press, 1987, pp. 1-28.

¹⁷D. R. Feenberg and J. M. Poterba, "Income Inequality and the Incomes of Very High-Income Taxpayers: Evidence

from Tax Returns," *Tax Policy and the Economy*, Volume 7, J. M. Poterba, ed., Cambridge: MIT Press, 1993, pp. 145-177.

¹⁸R. H. Gordon, "Taxation of Corporate Capital Income: Tax Revenues vs. Tax Distortions," *Quarterly Journal of Economics* (February 1985), pp. 1-27, and R. H. Gordon and J. D. Wilson, "Measuring the Efficiency Cost of Taxing Risky Capital Income," *American Economic Review* (June 1989), pp. 427-439.

argue that the presence of penalties serves to focus the firm's attention on safety issues, eventually leading to hazard abatement. Having multiple inspections of the same plant within the same year, with or without a penalty imposed, does not seem to reduce injuries further. Imposing larger penalties also does not seem to have much impact on injuries, at least within the range that OSHA usually employs.²

We also have examined the effectiveness of different types of inspections. For example, many inspections are based on worker complaints rather than being planned by OSHA. Some have argued that if workers are ignorant of true hazards and simply use complaints to harass employers, then these inspections may be a waste of OSHA resources. However, we find that complaint inspections are about as effective as planned inspections in reducing injuries.³ Complaints appear to be especially effective in larger plants, which tend to be more heavily unionized. Complaints also seem to be less reliant on penalties for their effectiveness, perhaps because the complaining workers can take advantage of the inspection to force hazard abatement, even when the firm is not penalized.

Health, Safety, and Environmental Regulation

Wayne B. Gray

Since the early 1970s, the United States has seen a substantial increase in federal government regulation, through the establishment of several new regulatory agencies. The Occupational Safety and Health Administration (OSHA) and the Environmental Protection Agency (EPA) have aroused particular controversy, attacked by some for being too strict and imposing large costs on business, and by others for being too lenient and allowing many hazards to remain. Congress is currently considering legislation affecting both agencies, and the debate about how much regulation is appropriate continues.

My research on OSHA and EPA has considered both the benefits and costs of regulation. I have examined the effectiveness of OSHA enforcement in reducing injuries, violations, and worker exposures to health hazards. My studies of the costs imposed by regulation have focused on the impact of regulation on productivity.

OSHA Safety Regulation

Traditionally, U.S. regulatory

agencies have followed a "command and control" strategy, establishing standards designed to reduce hazards and requiring firms to meet them. Since compliance is costly, some firms are likely to violate standards unless the agency's enforcement activity provided a sufficient deterrence. Critics of OSHA's safety regulation have argued that infrequent inspections and small penalties provide little deterrence. In addition, many injuries are caused by factors not covered by standards, so even complete compliance would not eliminate injuries completely.

John T. Scholz and I have found evidence that OSHA inspections do

"OSHA inspections do reduce injuries. . . . Plants penalized by OSHA averaged a 22 percent reduction in injuries over the following few years."

reduce injuries.¹ This impact appears to be restricted to inspections followed by penalties; not being penalized means OSHA found nothing wrong, and nonpenalty inspections had little or no effect on injuries. Plants penalized by OSHA averaged a 22 percent reduction in injuries over the following few years. We

OSHA Health Regulation

Measuring the effectiveness of OSHA regulation for health hazards is difficult, since work-related illnesses can take years or decades to develop. This means that we must rely on indirect indicators of potential future illnesses, such as worker exposure to hazardous substances, rather than direct measures of current injuries. Since OSHA's health standards often are aimed precisely

at lowering worker exposures to hazards, violations of health standards also could indicate future health problems.

In work with Carol A. Jones, I examined OSHA's effectiveness, using data that linked all OSHA inspections at a given plant over time. First inspections tend to find the most violations, and subsequent inspections of the same plant find progressively fewer problems, suggesting that plants are responding to the earlier inspections by reducing hazards.⁴ For health and safety inspections, the first inspection seems to lead to a 50 percent reduction in violations.

We find similar effects when we focus exclusively on health inspections, with a 45 percent reduction of violations after the first inspection.⁵ OSHA inspectors also collect test samples to document workers' exposure to health hazards. We find that worker overexposure to hazardous substances falls, with a decline of 37 percent after the first inspection, and continues to decline after subsequent inspections. These results suggest that OSHA is effective in reducing health hazards, at least in those plants that have had health inspections. Because most of the reduction in hazards is attributed to the first inspection of a plant, our results also provide a suggestion for improving enforcement effectiveness: focus more on uninspected plants, rather than inspecting the same plants repeatedly.

Regulation and Productivity

It can be difficult to identify the costs imposed by regulation. Compliance with a particular regulation

may involve new capital equipment, the energy and labor needed to operate the equipment, and the managerial and engineering expertise to decide which equipment is needed. For environmental regulation, there are surveys of pollution abatement expenditures, but these may not consider all the different types of costs. If a plant chooses to completely redesign its production process to reduce emissions, it may be difficult to identify what fraction of the redesign costs should be attributed to pollution abatement.

One way to go beyond reported compliance costs is to examine productivity measures. This is especially true for measures of total

"Industries that faced more regulation had slower productivity growth and a greater productivity slowdown in the 1970s. About 30 percent of the productivity slowdown in the average manufacturing industry could be attributed to OSHA and EPA regulation."

factor productivity, which account for the contribution of both capital and labor to output. If a changed production process means higher production costs, then productivity will fall. Examining productivity also can help measure compliance costs of other regulatory areas, such as OSHA, where no cost surveys are done.

My research on regulation began by examining the reasons for the slowdown in manufacturing productivity during the 1970s. I compared the productivity experience of different manufacturing industries with the amount of OSHA and EPA regulation directed toward them.⁶ Regulation measures included enforcement activity for

both OSHA and EPA, as well as pollution abatement costs. Industries that faced more regulation had slower productivity growth and a greater productivity slowdown in the 1970s. About 30 percent of the productivity slowdown in the average manufacturing industry could be attributed to OSHA and EPA regulation.

Modeling Regulation

The decisions of regulatory agencies and regulated firms can be interconnected, especially when the regulators want to avoid adverse publicity associated with plant closings. Mary Deily and I examined this issue using data on air pollution enforcement and plant closings in the steel industry, where such pressures were acute: 43 percent of the plants we studied closed by 1986.⁷ Plants facing greater expected enforcement were more likely to close, although the magnitude of the effect was small (raising enforcement by 12 percent would increase the probability of closing by only 1 percentage point). Enforcement decisions appear to be more sensitive to the likelihood of a plant closing: a 10 percentage point increase in the probability of closing reduces enforcement by 6.5 percent.

¹W. B. Gray and J. T. Scholz, "Does Regulatory Enforcement Work? A Panel Analysis of OSHA Enforcement," NBER Working Paper No. 3774, July 1991, and *Law and Society Review* 27 (1993), pp. 177-213; also J. T. Scholz and W. B. Gray, "OSHA Enforcement and Workplace Injuries: A Behavioral Approach to Risk Assessment," NBER Working Paper No. 2813, January 1989, and *Journal of Risk and Uncertainty* 3 (1990), pp. 283-305.

²W. B. Gray and J. T. Scholz, "Analyzing the Equity and Efficiency of OSHA

Enforcement," *Law and Policy* 13 (1991), pp. 185-214.

³W. B. Gray and J. T. Scholz, "How Effective Are Complaint Inspections?" report submitted to OSHA, June 1992.

⁴W. B. Gray and C. A. Jones, "Longitudinal Patterns with OSHA Health and Safety Regulations in the Manufacturing Sector," NBER Working Paper No. 3213, December 1989, and *Journal of Human Resources* 26 (1991), pp. 623-653.

⁵W. B. Gray and C. A. Jones, "Are OSHA Health Inspections Effective? A

Longitudinal Study in the Manufacturing Sector," NBER Working Paper No. 3233, January 1990, and *Review of Economics and Statistics* 73 (1991), pp. 504-508.

⁶W. B. Gray, "The Cost of Regulation: OSHA, EPA, and the Productivity Slowdown," NBER Working Paper No. 1405, July 1984, and *American Economic Review* 77 (1987), pp. 998-1006.

⁷M. Deily and W. B. Gray, "Enforcement of Pollution Regulations in a Declining Industry," *Journal of Environmental Economics and Management* 21 (Fall 1991), pp. 260-274.

NBER Profile: Sebastian Edwards

Sebastian Edwards is currently Chief Economist for the Latin American and the Caribbean region at the World Bank, and the Henry Ford II Professor of International Business Economics at Anderson Graduate School of Management, University of California, Los Angeles. He has been an NBER research associate in international studies since 1982, and is cochairman of the NBER's Inter-American Seminar in Economics.

Edwards was born in Santiago, Chile. He was educated at the Catholic University of Chile, and received an M.A. and Ph.D. in economics at the University of Chicago.

Edwards has been a consultant to a number of institutions, including the Inter-American Development Bank, the World Bank, the IMF, the OECD, and the U.S. Agency for Economic Develop-

ment. He has worked in Argentina, Bolivia, Mexico, Colombia, Guatemala, Nicaragua, Honduras, Costa Rica, Morocco, Chile, Indonesia, New Zealand, Korea, Tanzania, and Venezuela.

Coeditor of the *Journal of Development Economics*, Edwards's own articles on international economics, macroeconomics, and economic development have been published in a number of professional journals. His books include *Monetarism and Liberalization: The Chilean Experiment* (coauthor); *Exchange Rate Misalignment in Developing Countries*; and *Real Exchanges, Devaluation, and Adjustment: Exchange Rate Policy in Developing Countries*.

Edwards is married to Alejandra Cox, also a Chicago economist. They currently live in Bethesda, MD, with their children, Magdalena



(17), Benjamin (12), and Victoria (9). With so many children, they cannot afford a pet. Edwards collects Latin American art, and lately has become an obsessive runner. There are rumors that he is writing a novel.



NBER Profile: *Roger H. Gordon*

Roger H. Gordon has been a member of the NBER's Program in Public Economics (formerly Taxation) since 1977, and a professor of economics at the University of Michigan since 1986. He received his B.A. in applied math from Harvard College, and his Ph.D. in economics from MIT.

Gordon was an assistant professor at Princeton University in 1976–80, a member of the technical staff at Bell Laboratories from 1980–3, and an associate professor of economics at Michigan from 1984–6. He also has been a visiting professor at Tel-Aviv University, University of Bonn, People's University in Beijing, New University of Lisbon, the then Central School of Planning and Statistics in War-

saw, University of Wisconsin, MIT, University of Munich, University of Tilburg in the Netherlands, and Northwestern University.

Gordon has been coeditor of the *American Economic Review* since 1991, and has been a member of the editorial boards of *Econometrica*, *Journal of Public Economics*, and *International Tax and Public Finance*. His research on taxation has been published in a number of scholarly journals, and in NBER books and Working Papers.

Gordon's wife, Michelle White, is also an economics professor at the University of Michigan. They enjoy hiking, going to the opera, and traveling to out-of-the-way places.

NBER Profile: *Wayne B. Gray*

Wayne B. Gray is a research associate in the NBER's productivity and labor studies programs, and an associate professor of economics at Clark University. He has taught at Clark since 1984, when he received his Ph.D. from Harvard University. He did his undergraduate work at Dartmouth College.

Gray's research has concentrated on the effects and effectiveness of government regulation, especially OSHA and EPA regulation of workplace and environmental hazards. He recently spent a year as a Census Fellow at the Census Bureau's Center for Economic Studies in

Washington, working with plant-level productivity data. He now is helping to make that data available to researchers outside of Washington, serving as the Research Coordinator for the Census Bureau's newly established Boston Research Data Center.

Gray's wife, Elizabeth, is a biologist, specializing for the moment in studying the behavioral eccentricities of Erika (7) and Ronald (3). Gray's hobbies include squash (both playing and growing), cross-country skiing, and science fiction.





NBER Profile: *James F. Smith*

James F. Smith, president of the National Association of Business Economists in 1989-90, has represented that organization on the NBER's Board of Directors since 1992. Smith is also a professor of finance at the Kenan-Flagler Business School at the University of North Carolina, Chapel Hill.

A native of Dallas, Smith received his B.A., M.A., and Ph.D. in economics from Southern Methodist University. He worked at Sears, Roebuck, and Company in Chicago from 1965-80, and was chief economist for the Union Carbide Corporation from 1980-5. The following year,

Smith was director of regional services and U.S. consulting for Wharton Econometric Forecasting Associates. From 1986-8, he was at the University of Texas, Austin, as senior lecturer in finance and director and chief economist of the Bureau of Business Research.

Smith also served as senior economist on the Board of Governors of the Federal Reserve System in 1975-7, and as a consultant to the Council of Economic Advisers in 1981. He and his wife, Susan, who serves as a volunteer at Triangle Hospice, have four grown children: three sons and a daughter. The Smiths' hobbies include playing bridge and traveling.

Conferences

Regionalism

The NBER, in cooperation with the Tokyo Center for Economic Research (TCER) and the Centre for Economic Policy Research (CEPR), sponsored a conference on "Regionalism" in Tokyo on January 8 and 9. Takatoshi Ito, NBER, and Hitotsubashi University; Peter Johns, CEPR; and Kazuo Ueda, University of Tokyo, planned this program.

Jonathan Eaton, NBER and Boston University, and **Akiko Tamura**, Boston University, "Bilateralism and Regionalism in Trade and

Investment: The United States and Japan"

Discussants:

Kyoji Fukao, Hitotsubashi University, and Sadao Nagoaka, Seikei University

Toshihiro Ihori, University of Tokyo, "Economic Integration of Countries with International Public Goods"

Discussants:

Jonathan Eaton, and Yasushi Iwamoto, Kyoto University

Andrew Hughes Hallett, Strathclyde University, and **C. A. Primo Braga**, World Bank, "The New Regionalism and the Threat of Protectionism"

Discussants:

Kym Anderson, University of Adelaide, and Midori Tani, Ministry of International Trade & Industry

Kym Anderson, and **Richard H. Snape**, Monash University, "European and American Regionalism: Effects, On and Options for Asia"

Discussants:

Taro Akiyama, Yokohama National University, Takatoshi Ito, and Midori Tani

Sadao Nagoaka, "Regional Integration and External Liberalization: A Political Economy Approach"

Discussants:

Andrew Hughes Hallett, and
Tetsushi Honda, Tokyo
Metropolitan University

Warwick J. McKibbin,

Australian National University,
"Dynamic Adjustment to Regional
Integration: Europe 1992 and
NAFTA"

Discussants:

David Selover, Wesleyan
University, and
Shin-Ichi Fukuda, Hitotsubashi
University

Shin-Ichi Fukuda, and

Ji Cong, Keio University, "On the
Choice of Invoice Currency by
Japanese Exporters: the PTM
Approach"

Discussants:

Warwick J. McKibbin and
Kazuo Ueda

Eaton and Tamura analyze patterns of Japanese and U.S. trade and investment. They note that both Japan and the United States have strong ties to each other and to East Asia, while the United States also has strong ties to other countries in the Western Hemisphere. Even after taking scale and region into account, the authors find, trade flows and direct foreign investment positions are highly correlated across countries. While outward direct foreign investment is highly correlated with exports, it is also highly correlated with imports. This suggests that there is little association between outward direct foreign investment and the bilateral trade balance.

Ihori models economic integration subject to random emergency costs. To mitigate the effects of these emergencies, each country that belongs to a "club" provides an international public good. Ihori shows that an increase in the prob-

ability of war, or the penalty ratio in a club, may raise welfare and increase the size of the club if there is little risk aversion with respect to private consumption.

Hallett and Braga discuss the incentives that lead countries to form trading blocs, and the relations between these blocs. They argue that regional agreements can work better toward cooperation than global rules, because the losses for a participant ostracized from his bloc are more immediate and tangible. However, intrabloc trade relations ultimately will depend on how effective special interest groups are in distorting blocwide trade policies to suit their particular interests.

Anderson and Snape find that the share of intraregional world trade has been increasing. Further, the proportion of GDP traded has been increasing rapidly enough for growth to occur in extraregional trade. They argue that, on balance, the concerns of economies excluded from regional agreements with regard to trade and investment diversion probably are exaggerated. Still, the authors conclude that the excluded small open economies have cause for concern that regional agreements will erode the GATT-based multilateral trading system.

Nagoaka analyzes the effects of regional integration on external liberalization of industries protected for political reasons. He demonstrates that regional integration creates four positive incentives for liberalization, including reducing the degree of policy endogeneity and its negative incentive effect. He also analyzes how these effects are influenced by political integration (that is, shifting the focus of political concern from national to regional industries) and by the de-

gree of policy coordination (that is, free trade agreements versus customs unions).

Recent research on the gains to trade liberalization suggests that the static gains that many economists attempt to measure may be dwarfed by the dynamic gains, for example through capital accumulation. A similar argument can be made for the consequences of regional integration: as distortions are removed, the effects on aggregate output through dynamic adjustments are likely to be larger than simple static calculations suggest. **McKibbin** focuses on the dynamic gains to regional integration for two recent episodes: European integration, known as Europe 1992; and the North American Free Trade Agreement. He estimates the size and nature of both global and regional adjustments to these two examples of regional integration.

Fukuda and Cong investigate why invoice ratios of the Japanese yen are relatively low for Japan's exports. Given the "pricing-to-market" behavior of Japanese exporters, demand conditions in the foreign markets can explain their choice of invoice currency. In particular, Fukuda and Cong explain why yen-denominated invoice ratios of TVs, VCRs, and automobiles are so low in exporting to the United States, but are very high in exporting to the East Asian countries.



Political Economy of Trade Protection

The NBER held a conference on "The Political Economy of Trade Protection" on February 3 and 4. The program, organized by NBER Research Associate Anne O. Krueger of Stanford University, was:

Douglas Nelson, Tulane University, "The Political Economy of U.S. Automobile Protection"

Discussants:

Anne Brunsdale, U.S. International Trade Commission, and Richard Cooper, Harvard University

Bruce Gardner, University of Maryland, "The Political Economy of U.S. Export Subsidies for Wheat"

David Orden, Virginia Polytechnic Institute, "Divergent Agricultural Interest Groups and the Political Economy of NAFTA"

Discussants:

William Frenzel, Brookings Institution; Robert Paarlberg, Wellesley College; and Edward Schuh, University of Minnesota

Douglas Irwin, University of Chicago, "Trade Politics and the Semiconductor Industry"

Discussants:

Andrew Dick, University of California, Los Angeles, and Lionel Olmer, Paul, Weiss, Rifkind, Wharton, & Garrison

Michael Finger and **Ann Harrison**, World Bank, "The MFA Paradox: More Protection and More Trade?"

Discussants:

Robert E. Baldwin, NBER and University of Wisconsin, Madison; Jagdish Bhagwati, Columbia University; and Mac Destler, University of Maryland

Michael Moore, George Washington University, "Steel Protection in the 1980s: The Waning Influence of Big Steel?"

Discussants:

William Lane, Caterpillar, Inc.; James R. Markusen, NBER and University of Colorado; and Michael Moskow, Northwestern University

Joseph Kalt, Harvard University, "Precedent and Legal Argument in U.S. Trade Policy: Do They Matter to the Political Economy of the Lumber Dispute?"

Discussants:

Geoffrey Carliner, NBER, and Alan Rugman, University of Toronto

Robert W. Staiger, NBER and University of Wisconsin, Madison, and

Frank A. Wolak, NBER and Stanford University, "Further Evidence on the Uses and Effects of Antidumping Law: Differences Across Import Sources"

Discussant:

Kala Krishna, NBER and Pennsylvania State University

VERs on Japanese autos accomplished the short-term economic goal of raising industry profitability, they were not successful in the long-run political goal of disciplining Japanese competition. With respect to long-run economic goals, Nelson argues that protection was not necessary for industry adjustment.

From 1985-93, the U.S. government provided \$4.9 billion in subsidies to targeted foreign buyers of U.S. wheat under its Export Enhancement Program (EEP). The subsidies averaged \$31 per metric ton, or about 25 percent of the U.S. price. But **Gardner** finds that the EEP generated little gain for U.S. farmers, compared to its costs. One economic argument for the EEP that also carried political weight was that, by increasing the costs of the European Community's wheat export subsidies, the EEP would encourage the EC to negotiate joint subsidy reductions. In fact, in 1993 the EC did agree to multilateral subsidy reductions in the GATT, as well as to reforming their own policies unilaterally.

Orden finds that there was widespread support for NAFTA by export-oriented U.S. agricultural producer groups, because of its proposed phase-out of trade barriers with Mexico. Wheat producers, however, withheld their endorsement, seeking leverage on Canadian export subsidies. And import-competing producers of peanuts, sugar, winter vegetables, and citrus opposed specific phase-out provisions. The agricultural commodity groups were able to bargain for support in the subsequent legislative debate, though. Final concessions protect sugar and winter fruits and vegetables from Mexican competition, and ensnarl the United States in disputes on Canadian wheat and peanut butter. This illustrates

Following a brief review of the economics of the auto industry and the consequences of its protection, **Nelson** discusses the politics surrounding the 1981 decision to ne-

gotiate a voluntary export restraint (VER). He also discusses the politics of North American integration from the point of view of the auto industry. He concludes that, while

the difficulty of moderating entrenched domestic farm programs through international agreements.

Irwin analyzes the political and economic forces leading up to the 1986 trade accord in which the United States forced Japan to end the "dumping" of semiconductors in all world markets and to help secure 20 percent of the Japanese semiconductor market for foreign firms within five years. The antidumping provisions of the 1986 agreement resulted in such steep price rises for certain semiconductors that downstream user industries forced the U.S. government to remove them in the 1991 renegotiation of the agreement. The equally controversial 20 percent market share provision—based on circumstantial evidence that the Japanese market was closed—provided "affirmative action" for the industry in its efforts to sell more in Japan, but has been criticized as constituting "export protectionism."

According to **Finger** and **Harrison**, the textile industry's political power stemmed from its importance in southern states and from the power of the southern delegation in the U.S. Congress in the 1960s. Although the strongest resistance to the industry's pressure for protection came from the foreign policy interests of the executive branch, the southern delegation forced negotiation of voluntary export restraints by major exporters by holding hostage the Kennedy administration's trade expansion bill. And, through their particular power over agricultural legislation, the southern delegation won passage of amendments to agriculture bills to enforce these "voluntary" restraints at the U.S. border.

Moore notes that the U.S. integrated steel industry has been very

successful in securing import protection over the last 20 years. Critical to that success has been a cohesive coalition of steel producers, the steelworkers' union, and "steel town" congressional representatives. The political strength of this coalition has diminished substantially over the last decade, as the integrated steel industry has restructured, and as minimills have become increasingly important. After 1989, quotas on steel were non-binding, and the industry was largely unsuccessful in obtaining antidumping duties in its 1993 unfair trade petitions.

For more than a decade, the United States and Canada have been engaged in a rancorous dispute over trade in softwood lumber. **Kalt** examines whether, and to what extent, the legal rules, standards, and precedents of countervailing duty law influence the success or failure of the two contending parties. He finds that an issue with large stakes is never lost

by the politically favored party, even when legal precedent and the burden of argument is against that party's interest.

Staiger and **Wolak** present further evidence on the effects of U.S. antidumping law on imports and domestic output, and on the ways in which antidumping law is used in the United States. They allow for the possibility that domestic firms may pursue independent filing strategies with respect to imports from different countries, and that the effects of filing on imports and domestic output may differ across import sources as well. By disaggregating in this way, they hope to contribute to a more comprehensive understanding of the uses and effects of antidumping law in practice.

Selected papers from this conference and their commentary will be published by the University of Chicago Press in an NBER conference volume. Availability of the volume will be announced in a future issue of the *NBER Reporter*.

Ninth Annual Conference on Macroeconomics

More than 80 academics, government economists, and journalists attended the NBER's Ninth Annual Conference on Macroeconomics in Cambridge on March 11 and 12. Stanley Fischer and Julio J. Rotemberg, both of NBER and MIT, prepared this program.

Christina D. Romer and **David H. Romer**, NBER and University of California, Berkeley, "What Ends Recessions?"

Discussants:

John H. Cochrane, NBER and University of Chicago, and Ray C. Fair, Yale University

Andrew Atkeson, NBER and University of Chicago, and **Christopher Phelan**, University of Wisconsin, "Reconsidering the Costs of Business Cycles with Incomplete Markets" (NBER Working Paper No. 4719)

Discussants:

John C. Heaton, NBER and MIT, and

James Tobin, Yale University

John Page, World Bank, "The East Asian Miracle: Four Lessons for Development Policy"

Discussants:

Susan M. Collins, NBER and Georgetown University, and

Takatoshi Ito, NBER and Hitotsubashi University

Alan J. Auerbach, NBER and University of Pennsylvania, "The U.S. Fiscal Problem: Where We Are, How We Got Here, and Where We Are Going" (NBER Working Paper No. 4709)

Discussants:

Martin Feldstein, NBER and Harvard University, and

V. V. Chari, Northwestern University

Christopher A. Sims, NBER and Yale University, and

Eric Leeper, Federal Reserve Bank of Atlanta, "Toward a Modern Macroeconomic Model Usable for Policy Analysis"

Discussants:

Robert G. King, University of Virginia, and

Laurence H. Meyer, Laurence H. Meyer Associates

Philippe Aghion, Oxford University, and

Olivier J. Blanchard, NBER and MIT, "On the Speed of Transition in Central Europe" (NBER Working Paper No. 4736)

Discussants:

Patrick J. Kehoe, University of Pennsylvania, and

David Lipton, U.S. Department of the Treasury

Romer and Romer analyze the contributions of both monetary and fiscal policy to postwar economic recoveries. They find that the Federal Reserve typically responds to downturns with prompt and large reductions in interest rates. These interest rate declines account for nearly all of the above-average growth that occurs in the first year of recoveries, Romer and Romer find. In contrast, fiscal policy rarely changes before the trough in economic activity, and even then its responses are usually small. On several occasions, though, expansionary fiscal policies have made a substantial contribution to above-normal growth *outside* of recoveries.

Atkeson and Phelan argue that the main effect of countercyclical policy aimed at reducing aggregate economic fluctuations may be simply to ensure that all individuals do not face the same risk of unemployment at the same time. They show that the potential welfare

gains from eliminating that correlation in risk among individuals is *smaller* when there are incomplete markets than when markets are complete. They conclude that there is essentially no potential welfare gain from countercyclical policies that do not change individual risk.

Page looks at four public policy lessons of the East Asian miracle. He argues first that the eight high-performing Asian economies can be grouped together and distinguished from other low- and middle-income countries on the basis of their rapid, sustained, and shared growth. He then presents evidence on the relative roles of factor accumulation and change in total factor productivity (TFP) for growth. Page concludes that export orientation rather than selective intervention played the dominant role in increasing economywide TFP growth rates.

According to **Auerbach**, deficit forecasts over the past decade have

proved very inaccurate and overly optimistic. There is no simple explanation for such errors, and hence no obvious remedy for the future. The budget rules of the period may have hastened legislators to act, but were poorly designed for the purpose of restoring fiscal balance. The Gramm-Rudman-Hollings Act and, particularly, the 1990 Budget Enforcement Act, embedded forecasting errors in their rules; both permitted the postponement of serious action. Even with the passage of the 1993 Omnibus Budget Reconciliation Act, the United States still faces a major fiscal imbalance, attributable to growing health care costs and changing population demographics.

Sims and Leeper build a relatively complete econometric model whose equations are consistent with a theoretical model. Thus, they aim to bridge the gap between the literature that fits comprehensive econometric models to U.S. data, and the literature on complete general equilibrium models.

Transition in Central Europe involves the closing and restructuring of state firms, as well as the emergence of a new private sector. The speed of closing and restructuring, and the rate of private job creation, determine the dynamics of unemployment. Unemployment in turn affects the decisions both to restructure and to create new private jobs. **Aghion and Blanchard** present a model that captures these interactions, characterizes the equilibrium speed of transition and unemployment, and describes the role of policy.

These papers and their discussions will be published by the MIT Press as *NBER Macroeconomics Annual, Volume 9*. Its availability will be announced in a future issue of the *NBER Reporter*.

Taxing Multinational Corporations

More than 80 economists, policymakers, and journalists met in Washington, DC on April 19 for a nontechnical NBER conference on "Taxing Multinational Corporations" organized by Bureau President Martin Feldstein, James R. Hines, Jr. of NBER and Harvard University, and R. Glenn Hubbard, NBER and Columbia University. The program was:

Robert E. Lipsey, NBER and Queens College, "Outward Direct Investment and the U.S. Economy" (NBER Working Paper No. 4691)

Martin Feldstein, "Tax Rules and the Effect of Foreign Direct Investment on U.S. National Income"

Joosung Jun, NBER and Yale University, "Corporate Taxes and the Cost of Capital for U.S. Multinationals"

Roger H. Gordon and **Jeffrey K. MacKie-Mason**, NBER and University of Michigan, "The Importance of Income Shifting to the Design and Analysis of Tax Policy" (NBER Working Paper No. 4690. For a description of this paper, see the text referred to in footnote 13 of Gordon's research summary earlier in this issue, "The Role of Corporate Taxes in an Open Economy.")

According to **Lipsey**, overseas production has contributed to the ability of American multinationals to retain world market shares in the face of the long-term decline in the share of the United States as a country, and in the face of short-term changes, such as exchange rate fluctuations. Overseas production has performed the same func-

Andrew B. Lyon, NBER and University of Maryland, and **Gerald Silverstein**, U.S. Department of the Treasury, "Alternative Minimum Tax Rules and Multinational Corporations"

James R. Hines, Jr., "Taxes, Technology Transfer, and the R and D Activities of Multinational Firms"

Rosanne Altshuler, NBER and Rutgers University, and **T. Scott Newlon** and **William C. Randolph**, U.S. Department of the Treasury, "Tax Planning, Timing Effects, and the Impact of Repatriation Taxes on Dividend Remittances" (NBER Working Paper No. 4667)

Jason G. Cummins, Columbia University, and **R. Glenn Hubbard**, "Is Foreign Direct Investment Sensitive to Taxes?" (NBER Working Paper No. 4703)

Kenneth A. Froot, NBER and Harvard University, and **James R. Hines, Jr.**, "Interest Allocation Rules and the Changing Cost of Debt Finance"

Jason G. Cummins, **Trevor Harris**, and **Kevin A. Hassett**, Columbia University, "International Accounting, Asymmetric Information, and Firm Investment" (NBER Working Paper No. 4685)

tions for Swedish firms and, more recently, for Japanese firms. Within U.S. multinationals, those with higher shares of production overseas have higher employment at home relative to production at home. Foreign production appears to require larger numbers of employees in headquarters activities, such as R and D, and supervision.

Feldstein shows that the credit for foreign taxes paid does not induce U.S. firms to expand their foreign direct investment (FDI) enough so that the return on FDI to the United States is less than the return on the displaced domestic investment. A typical marginal FDI (which has the same net return to an American multinational parent as an alternative marginal domestic investment) actually has a higher return to the United States than the domestic investment it displaces. In order to maximize the present value of U.S. national income, one would not replace the current foreign tax credit with a deduction for foreign taxes. Instead, one would move in the opposite direction, encouraging more FDI in general, and investments that employ substantial foreign debt per dollar of U.S. capital in particular.

Jun modifies the conventional cost-of-capital measure to incorporate the impact of international tax rules. He finds that corporate tax rules on foreign investment cause U.S. firms operating in major foreign markets to face about a 20 percent higher cost of capital on average than domestic firms in the United States. Further, U.S. firms very likely face a higher cost of capital than local firms in foreign markets. U.S. firms also may have a cost-of-capital disadvantage vis-à-vis firms from other countries in a given foreign market, in part because of the absence of a dividend imputation scheme in the United States and in part to relatively strict U.S. rules regarding the exemption or deferral of home country tax on foreign source income and the foreign tax credit utilization.

Lyon and **Silverstein** show some of the ways that U.S.-based multinational corporations may be affected by the alternative mini-

mum tax (AMT). In 1990, more than half of all foreign-source income was received by corporations subject to the AMT. As a result, the tax prices on foreign-source income created by the AMT may be at least as important as those created by the regular tax. The AMT creates a relative incentive for AMT firms to invest abroad rather than domestically, and a temporary timing opportunity that allows repatriation of income from abroad at a lower cost than if the firm were subject to the rules of the regular tax system. These two different incentives have an ambiguous effect on U.S. domestic investment overall if repatriated income is retained by the parent in the United States. The AMT may provide an opportunity for firms to repatriate income from foreign locations with poor reinvestment opportunities, and to reinvest the funds abroad in different foreign locations with better opportunities, in order to take advantage of the temporary relatively lower cost of capital.

Hines asks first whether R and D activity by multinational firms is sensitive to local tax conditions, and second whether imported technology and R and D are complements or substitutes. He finds that R and D responds to local tax rates, and that local R and D is a substitute for imported technology. Firms appear to react to high royalty tax rates by paying fewer royalties and performing additional R and D locally. To the extent that royalty payments reflect actual technology transfer (rather than adept accounting practices), the behavior of multinational firms suggests that local R and D is a substitute for imported technology.

Altshuler, Newlon, and Randolph recognize that repatriation taxes on dividends may vary over

time, providing firms with an incentive to time repatriations so that they occur in years when repatriation tax rates are relatively low. They use information about cross-country differences in tax rates to estimate the influence of permanent tax changes, as would occur with changes in statutory tax rates, versus the influence of transitory tax changes on dividend repatriations. Using data from U.S. tax returns for a large sample of U.S. corporations and their foreign subsidiaries, they find that the permanent tax price effect is significantly different from the transitory price effect, and is not significantly different from zero. The transitory tax price effect is negative and significant. This suggests that repatriation taxes *do* affect dividend repatriation, but only to the extent that they vary over time.

Cummins and Hubbard use previously unexplored panel data on FDI by subsidiaries of U.S. multinational firms that contain information on new capital investment overseas. This enables them to measure tax influences on FDI more precisely, and to focus on structural models of subsidiaries' investment decisions. Their empirical results cast significant doubt on the simplest notion that "taxes don't matter" for U.S. firms' FDI decisions. Taxes appear to influence FDI in precisely the ways indicated by traditional neoclassical economic models of investment behavior. The authors' results also support the application of the "tax capitalization" model to the study of dividend repatriation and FDI decisions.

Froot and Hines examine the impact of the change in the U.S. interest allocation rules that followed passage of the Tax Reform Act of 1986. The 1986 act significantly lim-

ited the tax deductibility of the U.S. interest expenses of certain American multinational corporations. This tax change increased the tax liabilities of certain American multinationals, and made additional borrowing more expensive for these firms. Froot and Hines find that the change in interest allocation rules discouraged borrowing and new investments. Firms that were unable to deduct all of their interest expenses against their U.S. tax liabilities issued 4.2 percent less debt (measured as a fraction of total firm assets), and invested 3.5 percent less in property, plant, and equipment during 1986-91 than other firms did. This is consistent with other evidence that suggests that the Tax Reform Act of 1986 significantly raised the borrowing costs of some American multinational firms.

Cummins, Harris, and Hassett describe two different accounting regimes that govern reporting practices in most developed countries. "One-book" countries, such as Germany, use their tax books as the basis for financial reporting. "Two-book" countries, including the United States, keep the books largely separate. Firms in one-book countries may be reluctant to claim some tax benefits if reductions in their taxable income can be misinterpreted by financial market participants as signals of lower profitability. The authors' estimates suggest that differences in accounting regimes play an important role in describing domestic investment patterns, both within and across countries.

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

Bureau News

Industrial Organization Program Meeting

Members of the NBER's Program in Industrial Organization held their winter meeting on February 11 and 12. Program director Nancy L. Rose, NBER and Stanford University, and Robert H. Porter, NBER and Northwestern University, selected the following papers for discussion:

Steven T. Berry and **Ariel Pakes**, NBER and Yale University, and **James A. Levinsohn**, NBER and University of Michigan, "Voluntary Export Restraints and the U.S. Automobile Industry"

Discussant:

Frank A. Wolak, NBER and Stanford University

William M. Emmons III, Harvard University, and **Robin A. Prager**, MIT, "The Effects of Market Structure and Ownership on Prices and Service Offerings in the U.S. Cable Television Industry"

Discussant:

Margaret Slade, University of

British Columbia

Steven N. Wiggins, Texas A&M University, and

Robert Maness, Louisiana State University, "Price Competition in Pharmaceutical Markets"

Discussant:

Michael D. Whinston, NBER and Harvard University

Nancy L. Rose, and

Andrea Shepard, NBER and Stanford University, "Firm Diversification and CEO Compensation: Managerial Ability or Executive Entrenchment?" (NBER Working Paper No. 4723)

Discussant:

Benjamin Hermalin, University of California, Berkeley

Timothy F. Bresnahan, NBER and Stanford University, and

Shane Greenstein, NBER and University of Illinois, "The Competitive Crash in Large Scale Computing"

Discussant:

Bronwyn H. Hall, NBER and

University of California, Berkeley

Glenn Ellison, Harvard University, and

Edward L. Glaeser, NBER and Harvard University, "Geographic Concentration in U.S. Manufacturing Industries: A Dartboard Approach"

Discussant:

Peter C. Reiss, NBER and University of Wisconsin, Madison

Anne Gron, University of Chicago, "Regulation and the Prevalence of Direct Writers in Property-Casualty Insurance"

Discussant:

Nancy Wallace, University of California, Berkeley

Steven T. Berry,

Michael Carnall, University of Illinois, and

Pablo Spiller, University of California, Berkeley, "Airline Hubs: Cost and Demand"

Discussant:

Severin Borenstein, NBER and University of California, Berkeley

Berry, Levinsohn, and Pakes estimate that the Voluntary Export Restraint (VER) imposed by the United States on imports of automobiles from Japan during the 1980s was not really binding in its initial years, but increasingly became binding as the U.S. recession faded. They also find that, had a tariff been used instead of a VER, the import restriction would have enhanced U.S. welfare by about \$4 billion from 1985-8 relative to free trade (no import restriction).

Drawing on data from 1983 and 1989, **Emmons** and **Prager** ana-

lyze the underlying characteristics and behavior of competing versus monopoly cable television operators on the one hand, and privately versus nonprivately owned operators on the other. They find that competition and nonprivate ownership are associated with significantly lower prices for basic cable television service, but no differences in service quality.

Wiggins and **Maness** investigate the relationship between the number of competitors and the intensity of price competition in the pharmaceutical industry. They find

that prices start out high, decline sharply with early entry while remaining substantially above marginal cost, and then continue to decline with an increased number of sellers, even when there are relatively large numbers (20-30) of competitors. Their results support the position that entry of competing products offers pricing discipline for market leaders.

Rose and **Shepard** analyze data on 558 CEOs during 1985-90 that suggest that there are substantial compensation premiums for managers of diversified firms. The CEO

of a firm with two distinct lines of business averages 10 to 12 percent more in salary and bonus, and 13 to 17 percent more in total compensation, than the CEO of a similar-sized but undiversified firm. This corresponds to an average salary gain of \$100,000 to \$145,000 per year. Diversification may raise pay either because the CEO's job requires higher ability, or because it is associated with CEO entrenchment. The data support the ability explanation: the diversification premium is unaffected by tenure, and increasing diversification reduces compensation for incumbent CEOs.

Using a large dataset on mainframe computer users, **Bresnahan** and **Greenstein** focus on the changes wrought by the diffusion of microprocessor-based systems between 1984 and 1991. They find that many buyers face significant adjustment costs in moving between alternative computing platforms.

Ellison and **Glaeser** discuss the prevalence of Silicon Valley-style localization of individual manufacturing industries in the United States. They reaffirm previous observations that almost all industries are localized, although they find the degree of localization to be slight in about half of the industries in their sample. They use a number of comparisons to describe the scope and extent of geographic concentrations in U.S. manufacturing industries.

Gron finds that regulation of insurance rates is associated with significantly lower market shares for direct writers, or exclusive agents of insurers. However, the estimated difference between direct writers' market share in regulated and unregulated states is nearly the same for automobile lines, where regulation applies, as for homeowners' insurance, where regulation does

not affect prices directly. Systematic differences in profitability, growth, or firm size across regulated and unregulated states do not explain the observed relationship between rate regulation and direct writer market share, either.

Some analysts emphasize the potential for "monopoly power" on flights out of airline hubs, while some emphasize the potential cost reductions. **Berry, Carnall,** and **Spiller** combine a differentiated products model of demand for air travel with a model that allows hubs to decrease costs through the airlines' use of more efficiently sized planes. They find that hubs allow firms to charge higher prices to business travelers, but there are also cost reductions, at least for many types of flights. Further, variation in markups across different ticket prices accounts for at least one-third of the observed variance in prices, the authors estimate.

Blinder Nominated to Fed

Alan S. Blinder, who had been a research associate in the NBER's Program in Economic Fluctuations since 1978, was nominated by President Clinton to be vice chairman of the Federal Reserve Board of Governors. Blinder, who is also on leave from the economics department at Princeton University, is currently a member of the President's Council of Economic Advisers.

Blinder received his A.B. from Princeton, an M.Sc. from the London School of Economics, and a Ph.D. from MIT. He and his wife, Madeline, have two sons, Scott and William.



Economic Fluctuations Research Meeting

More than 65 members and guests of the NBER's Program in Economic Fluctuations gathered for a research meeting on February 17 and 18. Faculty Research Fellow Orazio Attanasio and Program Director Robert E. Hall, both of Stanford University, organized this agenda:

Steven J. Davis, NBER and University of Chicago, and **John C. Haltiwanger**, NBER and University of Maryland, "Driving Forces and Employment Fluctuations: New Evidence and Alternative Interpretations"
Discussant:
Robert E. Hall

John H. Cochrane, NBER and University of Chicago, "Shocks" (NBER Working Paper No. 4698)
Discussant:
Olivier J. Blanchard, NBER and MIT

Susanto Basu, University of Michigan, "Procyclical Productivity: Overhead Inputs or Cyclical Utilization?"
Discussant:
Narayana Kocherlakota, University of Iowa

Richard Startz, University of Washington, "Growth States and Sectoral Shocks"
Discussant:
Peter Klenow, University of Chicago

Valerie R. Bencivenga and
Bruce Smith, Cornell University,
and

Ross M. Starr, University of
California, San Diego, "Liquidity
of Secondary Capital Markets,
Capital Accumulation, and the
Term Structure of Asset Yields"

Discussant:

John C. Heaton, NBER and MIT

Lars Peter Hansen, NBER and

University of Chicago,

Thomas J. Sargent, NBER and
Stanford University, and

Thomas D. Tallarini, Jr.,
University of Chicago, "Pessi-
mism, Neurosis, and Feelings
About Risk in General
Equilibrium"

Discussant:

Andrew W. Abel, NBER and
University of Pennsylvania

Davis and **Haltiwanger** ask what types of disturbances, including oil price shocks and innovations in monetary policy, affect employment and how. Focusing on the U.S. manufacturing sector during the 1970s and 1980s, they find a consistent difference in the dynamic response of gross job flows to aggregate and allocative shocks. Aggregate shocks produce relatively short-lived effects on job creation and destruction. Allocative shocks cause a sharp increase in job destruction that diminishes quickly, but their impact on job creation is long lasting, and peaks at about four quarters. Finally, the dynamic response of job creation and destruction to oil and credit shocks does not closely resemble the response to either aggregate or allocative shocks. This suggests that oil and credit shocks do not fit the profile of either the typical aggregate or allocative disturbance.

What shocks drive economic fluctuations? **Cochrane** examines technology and money shocks in some detail, and briefly reviews the evidence on oil price and credit shocks. He concludes that none of these popular candidates can account for the bulk of economic fluctuations. He then examines whether "consumption shocks," news that agents see but that we do not, can account for fluctuations.

Basu begins with the premise that materials input is likely to be measured with less cyclical error than labor and capital input, and that materials are likely to be used in strict proportion to capital and labor. In that case, materials growth provides a good measure of the unobserved changes in capital and labor input. Using this measure, he finds that the true growth of variable labor and capital inputs, on average, is almost twice the measured change in the capital stock or labor hours. More than half of that is caused by the presence of overhead inputs in production; the rest is caused by cyclical factor utilization.

GNP growth typically vibrates around a mean of a few percent per year; but, periodically, mean growth undergoes a major shift, thereafter vibrating around a new level. **Startz** presents a transmission mechanism that translates random sectoral shocks into just this sort of behavior, creating what might be thought of as multiple growth states. Small shocks cause vibration within a state; sufficiently large shocks cause a change of state. The model has two output sectors: input factors are drawn into the "leading sector," where learning-by-doing increases that sector's technological lead. If the "leading sector" is also the inherently high-growth sector, then growth is fast in both sectors.

Shocks to preferences and technologies cause a switch in the leading role between the high-growth and slow-growth sectors.

Bencivenga, Smith, and Starr investigate the role of liquidity in determining the level of activity both in secondary capital markets and in the real economy. They focus on the implications of transaction costs (a measure of liquidity) for equilibrium values. Host transactions in the financial markets of advanced economies occur in the secondary market; they rearrange the ownership of existing capital, rather than channeling savings into new investment. This trade is nevertheless highly productive; by providing liquidity to wealthholders, it promotes the accumulation of long-lived capital necessary to economic development and to an advanced industrial economy.

Hansen, Sargent, and Tallarini introduce a "risk adjustment" into general equilibrium versions of linear-quadratic economies. In addition to augmenting risk premiums in security market prices, the risk adjustment implies equilibrium quantity allocation rules that are sensitive to the amount of uncertainty in the environment. An alternative interpretation of the risk adjustment is: a pessimistic distortion in the forecasts of economic agents.



Nonrepresentative Agent Models

Ricardo J. Caballero, NBER and MIT, and Andrew Caplin, NBER and Columbia University, organized a workshop on "Nonrepresentative Agent Models" on February 19 for members of the Bureau's Program in Economic Fluctuations. The agenda was:

Andrew Caplin, and **John V. Leahy**, NBER and Harvard University, "Miracle on Sixth Avenue: Information Externalities and Search" and "The Economics of Adjustment" (NBER Working Paper No. 4687)

Boyan Jovanovic, NBER and New York University, and **Yaw Nyarko**, New York University, "The Bayesian Foundations of Learning-by-Doing" and "A Bayesian Learning-by-Doing Model Fitted to Plant and Other Data"

Ricardo J. Caballero, and

Mohamad I. Hammour, Columbia University, "Of the Timing and Efficiency of Creative Destruction"

Olivier J. Blanchard, NBER and MIT,

Simon Commander, World Bank, and

Fabrizio Coricelli, University of Sienna, "Unemployment and Restructuring in Eastern Europe"

J. Joseph Beaulieu and **Joseph Matthey**, Federal Reserve Board of Governors, "The Effects of General Inflation and Idiosyncratic Cost Shocks on Within-Commodity Price Dispersion: Evidence from Microdata"

Ricardo J. Caballero, and **Eduardo Engel**, Harvard University, "Explaining Investment Dynamics in U.S. Manufacturing: A Generalized (S,s) Approach"

Caplin and **Leahy** show that a simple model can explain both the long period when properties on Lower Sixth Avenue in New York are vacant, and the speed of the subsequent turnaround in that portion of the real estate market. They assume that vacant buildings are options available for many alternative uses. Committing a property to any one of these uses is costly. Owners can learn about the best use for their property from the experience of neighboring properties. Caplin and Leahy suggest that the delay until the first vacant unit is occupied is too long, because each owner has an incentive to wait for another owner to accept a tenant in order to use that tenant's experience to improve the rental price decision.

In their second paper, **Caplin** and **Leahy** argue that many topics

in macroeconomics can be viewed as part of the broader theory of the economics of adjustment. Their approach to the economics of adjustment stresses the role of learning and information externalities. They discuss how these concerns alter the quantitative nature of the adjustment process. In particular, there appears to be a general bias toward the underprovision of information in a variety of settings, and that leads to inefficient adjustment.

Jovanovic and **Nyarko** propose a model of learning how to perform an activity, with only two parameters: how much productivity one can gain by learning; and how fast the learning is attained. They then fit the model to the experience of new plants, but it also can be fitted to the experience of workers learning about a new activity that they perform repeatedly.

The authors conclude that the gains from learning-by-doing on a *given* activity are large and highly variable. Also, the transfer of knowledge from one technological generation to the next is difficult to estimate and surprisingly weak.

Caballero and **Hammour** analyze the timing, pace, and efficiency of the ongoing process of job reallocation that results from product and process innovation. In an efficient economy, both job destruction and creation ought to occur during cyclical downturns, when the opportunity cost of reallocation is lowest. However, malfunctioning labor markets generally disrupt this synchronized pattern by decoupling creation and destruction. Recessions, by accelerating job destruction, will have a beneficial "cleansing" effect on the productive structure; however, if more unemployment is undesirable, then the cleansing effect is always outweighed by the welfare loss from higher unemployment.

Blanchard, **Commander**, and **Coricelli** describe the evolution of labor markets in Eastern Europe since the beginning of the economic transition, using a number of country studies carried out by the World Bank. Specifically, they show the dynamics of employment, unemployment, and wages in the private and state sectors. For a few countries, they estimate the gross flows among employment, unemployment, and nonparticipation. Based on those findings, the authors offer an informal model of the interactions between unemployment and restructuring.

Beaulieu and **Matthey** examine plant-level product records from the U.S. Census of Manufactures to estimate the effects of inflation on price dispersion through variation in the drift rate of average target

prices within a market. They explain about one-fifth of the variation in the amount of price dispersion across different commodities. In general, they find that the higher the drift rate of the desired price of a given commodity, the larger the amount of price dispersion. The standard deviation of idiosyncratic shocks also is correlated positively with the degree of price dispersion,

while the standard deviation of aggregate shocks is correlated negatively with price dispersion.

Caballero and Engel derive a model of sectoral investment, which builds from the microeconomic adjustments of firms facing stochastic fixed costs of adjustment. They find clear evidence of nonlinearities in the dynamic behavior of postwar sectoral invest-

ment in U.S. manufacturing equipment and structures. The mean and standard deviation of the distribution of fixed adjustment costs faced by firms are 16 and 6.5 percent of a year's revenue (net labor payments) for equipment, and 59 and 8 percent for structures. For a given sequence of aggregate shocks, the nonlinear model generates brisker expansions and sharper contractions than its linear counterpart.

Behavioral Theories of Financial Markets

An NBER meeting on theories of the behavior of financial markets, organized by Research Associates Robert J. Shiller of Yale University and Richard H. Thaler of Cornell University, took place in Cambridge on February 25 and 26. Behavioral theories of financial markets address the concerns, attitudes, and abilities of market participants, and attempt to explain patterns of prices and returns. Some research demonstrates that financial markets do not always function "efficiently"; other work studies human behavior itself, emphasizing actions taken in financial markets.

The program for this meeting was:

David Ikenberry, Rice University;

Josef Lakonishok, University of Illinois; and

Theo Vermaelen, The European Institute of Business Administra-

tion, "Market Underreaction to Open Market Share Repurchases"

Discussant:

William Nelson, Federal Reserve System

William Nelson, "Do Firms Buy Low and Sell High? Evidence of Excess Returns on Firms That Issue or Replace Equity"

Discussant:

Josef Lakonishok

William Goetzmann, Yale University, and

Nadev Peles, Columbia University, "Cognitive Dissonance and Mutual Fund Investors"

Discussant:

Richard Herrnstein, Harvard University

Brad Barber, University of California, Davis, "Noise Trader Risk, Odd-Lot Trading, and Security Returns"

Discussant:

Werner De Bondt, University of Wisconsin, Madison

David Hirshleifer and **Ivo Welch**, University of California, Los Angeles,

"Institutional Memory, Inertia, and Investment Decisions"

Discussant:

Jeremy C. Stein, NBER and MIT

Johnette M. Sigwarth,

University of Iowa, "Changes in Consumer Confidence and the January Small-Firm Effect"

Discussant:

Richard H. Thaler

Rafael LaPorta, Harvard

University, "Expectations and the Cross-Section of Stock Returns"

Discussant:

Kenneth R. French, NBER and University of Chicago

Jeffrey Pontiff, University of Washington, "Costs of Arbitrage in Closed-End Funds"

Discussant:

Andrei Shleifer, NBER and Harvard University

Ikenberry, Lakonishok, and **Vermaelen** examine the long-run performance of 1239 share repurchases announced during 1980 to 1990. Using carefully constructed benchmarks, they find that the average excess four-year buy-and-hold return after the announcement of a

share repurchase is 12.6 percent. For "value" stocks, companies that are more likely to be making repurchases because of valuation, the average excess return is 45 percent. Thus, undervaluation appears to be an important motive. Furthermore, it appears that the market errs in its

initial response, and ignores much of the signal conveyed by this type of repurchase announcement.

Nelson observes large, positive excess long-horizon returns for firms that buy their own equity and large, negative excess returns for firms that sell it. During 1926-85,

the margin between portfolios of firms that repurchased their own equity and those that issued equity was about 10 percent per year for the five years after a significant change occurred in shares outstanding. Firms of all sizes have excess returns, which tend to increase with firm size. There are excess returns for all three 20-year subperiods, and they have risen dramatically over time. The size and duration of the margin, as well as the pattern across firms grouped by past performance, suggest that equity transactions occur in anticipation of the excess returns.

Goetzmann and Peles propose that some mutual fund investors are motivated by cognitive dissonance in their response to past performance of mutual funds. Cognitive dissonance is the conflict between beliefs and actions. New investors implicitly justify their use of performance rankings by the need for a rational basis upon which to choose mutual funds. Existing mutual fund investors resist switching funds because it implies that their previous difficult choice was, in fact, wrong. They reduce cognitive dissonance by positively adjusting their beliefs about their current fund. As a consequence, money will tend to flow more quickly into winners than out of losers. Indeed, Goetzmann and Peles note that the results of a pilot questionnaire study of mutual fund investors confirm earlier documented evidence of an "endowment effect," and suggest the presence of cognitive dissonance.

Barber shows that small firms do well when small investors are optimistic. In contrast, large firms generally are unaffected by the sentiment of small investors. Barber also shows that, on average, securities

that are sensitive to changes in small investor sentiment (and thus have high levels of noise trader risk) earn higher returns than securities that are insensitive to changes in small investor sentiment.

Hirshleifer and Welch examine the consequences of imperfect institutional memory for organizational decisions. In their model, new managers are aware of the firm's previous actions, but not the rationale for these actions. If the environment is stable, a firm that has followed an old investment policy long enough, and then changes management, generally

"The average excess four-year buy-and-hold return after the announcement of a share repurchase is 12.6 percent."

will have a greater tendency to follow old actions than a firm with full memory (that is, if the old manager had continued). On the other hand, if the environment is volatile, and the old manager has followed a policy only briefly, then the previous investment decisions are not very informative, and new managers can be excessively impulsive (prone to follow their latest information without regard to history).

Do changes in consumer confidence explain the January small-firm effect? Surveys show that consumers experience renewed optimism in January and continued pessimism throughout the fourth quarter. **Sigwarth** considers changes in confidence stockselling for the purpose of tax losses, and differential information among shareholders. She shows that for 1983-92, changes in consumer confidence provide a partial explanation for the January small-firm effect.

LaPorta uses survey data on stock market analysts for 1981-9 to show that value strategies work because they exploit systematic errors in the way that investors form expectations about the future. Strategies that exploit errors in analysts' expectations earn high risk-adjusted returns, because investors overreact to new information. In the year following an analysis, analysts sharply revise their expectations in the direction and magnitude predicted by the overreaction hypothesis. Furthermore, the behavior of excess returns around quarterly earnings announcements supports the overreaction hypothesis.

Pontiff finds that the behavior of closed-end fund discounts is consistent with models of costly arbitrage. The market value of a closed-end fund is more likely to deviate from the value of its assets when interest rates are high, and for funds that: 1) have portfolios that are difficult to replicate; 2) pay out smaller dividends; and 3) have larger relative bid-ask spreads. These factors are related to the magnitude of the deviation, as opposed to the direction, and explain one-fifth of cross-sectional mispricing variation.



Productivity Program Meets

The NBER's Program in Productivity met in Cambridge on March 7. Adam B. Jaffe, NBER and Harvard University, organized the following program:

Samuel S. Kortum, NBER and Boston University, "A Model of Research, Patenting, and Productivity Growth" (NBER Working Paper No. 4646)

Discussant:

Peter Klenow, University of Chicago

Lynne G. Zucker and **Marilynn B. Brewer**, University of California, Los Angeles; and **Michael R. Darby**, NBER and University of California, Los Angeles, "Intellectual Capital and the Birth of U.S. Biotechnology

Enterprises" (NBER Working Paper No. 4653)

Discussant:

Joshua Lerner, Harvard University

Boyan Jovanovic, NBER and New York University, and **Yaw Nyarko**, New York University, "A Bayesian Learning-by-Doing Model Fitted to Plant and Other Data" (See "Nonrepresentative Agent Models" earlier in this section of the *Reporter*.)

Discussant:

Robert S. Pindyck, NBER and MIT

David Austin, Resources for the Future, "Patent Citations and Appropriability"

Discussant:

Jenny Lanjouw, NBER and Yale University

Kortum develops a model of research as a search process, seeking to explain the interrelationships among employment of research scientists and engineers, patented inventions, and total factor productivity. He suggests that inventions that can be patented are becoming increasingly difficult to discover as the quality of research techniques in use improves. Still, inventions that eventually are patented represent measurable improvements on current techniques. Since the economy is growing, patents are increasingly valuable, thereby explaining continued increases in research efforts.

Zucker, Darby, and Brewer examine how the intellectual capital of scientists making frontier discoveries, the presence of university bioscience programs and venture capital firms, and other economic variables are linked to the founding of U.S. biotechnology enterprises during 1976–89. They find that

the timing and location of the birth of biotech enterprises is determined primarily by intellectual capital measures, particularly the local number of highly productive "star" scientists actively publishing genetic sequence discoveries. They believe that biotechnology may be prototypical of the birth patterns in other innovative industries.

Analyzing a large collection of biotechnology patents, **Austin** evaluates a proxy for the value of a patent based on the number of patent citations. He finds that patents that eventually receive many citations are associated with larger positive stock market returns on their grant date than patents that ultimately receive no citations. Patents whose citations come largely from other patents owned by the same firm are more valuable (than other patents). Thus, the rate of "self-citation" is a good indicator of successful appropriation of the returns to the invention, Austin concludes.

During the afternoon session of the program meeting, Wes Cohen of Carnegie–Mellon University described his current study of cooperative university/industry research centers. Frank R. Lichtenberg, of NBER and Columbia University, discussed his project on R and D collaboration in Europe; Program Director Zvi Griliches, of Harvard University, talked about the Israeli data on R and D that he and Chaim Regev are collecting; and Ron Jarmin of the U.S. Census Bureau described his ongoing research on measuring spillovers in learning-by-doing among manufacturing establishments.



Mishkin to N.Y. Fed

Frederic S. Mishkin, a member of the NBER's Programs in Economic Fluctuations and Monetary Economics since 1980, was recently named Executive Vice President and Director of Research of the Federal Reserve Bank of New York. Mishkin will assume his new position in September, taking a leave from his post as the A. Barton Hepburn Professor of Economics at Columbia University's Graduate School of Business.

Mishkin received both his B.S. and Ph.D. from MIT. He has taught at the University of Chicago, Northwestern University, and Princeton University, and is the author of *The Economics of Money, Banking, and Financial Markets*, 3rd edition, the leading textbook in its field. Mishkin is also an associate editor of four professional journals, and has served on the editorial board of the *American Economic Review*.

Economic Growth

The NBER's Program on Economic Growth met in Cambridge on March 18 and 19. NBER Research Associates Robert J. Barro, Harvard University, and Paul M. Romer, University of California, Berkeley, organized this program.

Paul M. Romer, "New Goods, Old Theory, and the Welfare Costs of Trade Restrictions" (NBER Working Paper No. 4452)

Discussant: Oliver Hart, NBER and Harvard University

Philip Keefer and **Stephen Knack**, University of Maryland, "Institutions and Economic Performance: Cross-Country Tests Using Alternative Institutional Measures"

Discussant:

Jim Alt, Harvard University
Alwyn Young, NBER and MIT, "The Tyranny of Numbers: Confronting the Statistical Realities of the East Asian Growth Experience" (NBER Working Paper No. 4680)

Discussant: Hak-K. Pyo, Seoul National University

Boyan Jovanovic, NBER and New York University, and **Yaw Nyarko**, New York University, "The Bayesian Foundations of Learning by Doing" (See "Nonrepresentative Agent Models" earlier in this section of the *Reporter*.)

Discussant: Peter Howitt, University of Western Ontario

Andrew D. Foster and **Mark R. Rosenzweig**, University of Pennsylvania, "Technological

Change and Human Capital Returns and Investments: Consequences of the Green Revolution" Discussant:

Jonathan Morduch, Harvard University

Michael Kremer, NBER and MIT, and

Eric Maskin, Harvard University, "Segregation by Skill and the Rise in Inequality"

Discussant: Sherwin Rosen, University of Chicago

Casey B. Mulligan, University of Chicago, and **Xavier Sala-i Martin**, NBER and Yale University, "Some Evidence on the Link Between Aggregate Income and Human Capital"

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

According to **Romer**, the typical economic model implicitly assumes that the set of goods in an economy never changes. As a result, the predicted efficiency loss from a tariff is small: on the order of the square of the tariff rate. If we assume instead that international trade can bring new goods into an economy, then the fraction of national income lost when a tariff is imposed can be as much as two times the tariff rate.

Keefer and **Knack** find that institutions that protect property rights are crucial to economic growth and to investment. Moreover, the effect of those institutions on growth persists, even after controlling for investment. This suggests that the security of property rights affects not only the magnitude of investment, but also the efficiency with which inputs to production are allocated.

Young documents the funda-

mental role played by factor accumulation in explaining the extraordinary postwar growth of Hong Kong, Singapore, South Korea, and Taiwan. Participation rates, educational levels, and (with the exception of Hong Kong) investment rates have risen rapidly in all four economies. In addition, there have been large intersectoral reallocations of labor with (again, except in Hong Kong) nonagricultural and manufacturing employment growing one-and-a-half to two times as fast as the aggregate working population. Thus, while the growth of output per capita in these economies has averaged 6 to 7 percent per year over the past two-and-a-half decades, the growth of output per effective worker in the nonagricultural sector has been only 3 to 4 percent per year.

Foster and **Rosenzweig** examine the extent to which the returns

to schooling (and other factors of production) are altered by technical change. They use data from rural India spanning a period in which there were quite different rates of economic growth across regions because of differences in technologies. They find that the returns to education rose at higher rates in areas experiencing higher rates of increase in real agricultural profits. They also find that enrollment rates are higher in *all* rural households in areas with high rates of productivity. But, when the pace of technical change increases, enrollment rates respond positively only in farm households.

Kremer and **Maskin** note that recent increases in wage inequality have been accompanied by increasing segregation of high- and low-skilled workers into separate firms. Both trends can be explained if workers of different skill are not

perfect substitutes. Then either skill-biased technological progress or increased skill dispersion can cause high-skilled workers to segregate into separate firms and reduce wages of low-skilled workers. Data from the United States and United Kingdom suggest that skill-biased technological progress does not explain rising inequality.

Mulligan and Sala-i-Martin construct economywide aggregates of human capital for each of 48 states in six census years, 1940–90. Their measures focus on the earning power of the labor force, and allow for the fact that the relevance and quality of schooling and on-the-job training vary over time and across locations. They find that in

1990, the human capital stock was highest in New York, followed by Delaware and Minnesota. The lowest values were in Montana, Mississippi, and Rhode Island. The Northeast as a whole enjoyed the highest values of human capital between 1940 and 1980, but lost its lead to the Midwest in 1990.



Spring Meeting of Asset Pricing Program

Members of the NBER's Program in Asset Pricing met in Cambridge on April 8. Their agenda, organized by Andrew B. Abel, NBER and University of Pennsylvania, was:

Urban J. Jermann, Graduate Institute of International Studies, Geneva, "Asset Pricing in Production Economies"

Discussant:

John H. Cochrane, NBER and University of Chicago

Geert Bekaert, Stanford University,

Robert J. Hodrick, NBER and Northwestern University; and

David A. Marshall, Northwestern University, "The Implications of First-Order Risk Aversion for Asset Market Risk Premiums" (NBER Working Paper No. 4624)

Discussant:

Stanley E. Zin, NBER and Carnegie-Mellon University

Jacob Boudoukh and

Robert F. Whitelaw, New York University, and

Matthew Richardson, University of Pennsylvania, "Industry Returns and the Fisher Effect"

Discussant:

Frederic S. Mishkin, NBER and Columbia University

Peter Bossaerts, California Institute of Technology, and

Pierre Hillion, The European Institute of Business Administration, "Selecting Models to Forecast Financial Returns: A New Criterion"

Discussant:

Andrew W. Lo, NBER and MIT

Jaesun Noh and

Alex Kane, University of California, San Diego, and

Robert F. Engle, NBER and University of San Diego, "Test of Efficiency for the S&P 500 Index Option Market Using Variance Forecasts" (NBER Working Paper No. 4520)

Discussant:

David S. Bates, NBER and University of Pennsylvania

Robert F. Stambaugh, NBER and University of Pennsylvania, "Estimating Conditional Expectations When Volatility Fluctuates" (NBER Technical Paper No. 140)

Discussant:

Daniel Nelson, NBER and University of Chicago

Jermann develops a model to account for the fact that, historically, the average annual rate of return on equity has exceeded the annual rate of return on short-term debt by about 6 percentage points. In the model, consumers form habits that can lead to a relatively large premium in the return on stocks relative to bonds. The model also assumes that it is costly to change the capital stock, which leads to increases in the variability of stock prices. Further, the model includes financial leverage, which contributes to dividend volatility. Together, these effects account for about half of the premium earned by equity.

Traditional theoretical models have been unable to account for the apparent predictability of excess returns in markets for equity, bonds, and foreign exchange. **Bekaert, Hodrick, and Marshall** develop a new model based on a concept known as first-order risk aversion: that is, substantial aversion to even small gambles. Using this formulation of risk aversion in a two-country monetary model increases the degree to which asset returns are predictable, but not by enough to match the predictability of actual returns, as measured in the data.

Boudoukh, Richardson, and Whitelaw examine a specific example of the Fisher effect, in which a single percentage point increase in the expected rate of inflation leads to an equal increase in the expected rate of return on stocks. They note that, contrary to the Fisher effect, an increase in the expected rate of inflation often leads to a decrease in the expected rate of return on stocks. However, examination of stock returns for particular industries reveals that this negative relationship holds only for industries that are strongly procyclical.

Econometric models often suffer from overfitting: despite a high correlation between a model's predictions and actual data during the sample period, the correlation between predictions and actual data is low when forecasting beyond

the sample period. To avoid overfitting, **Bossaerts and Hillion** introduce a new statistical procedure for selecting an econometric model. If the true model that underlies the actual data does not change over time, the new procedure seems to work well. However, if the true model changes, then this new procedure also suffers from overfitting.

Changes in the volatility of the S&P index lead to changes in the prices of options on this index. Investors could use forecasts about this volatility in formulating strategies for trading these options. **Noh, Engle, and Kane** explore two methods of forecasting volatility: one method uses values of volatility implied by options prices in a regression to predict future volatility; the other method uses

the ARCH model. They show that an investor who bases a trading strategy on estimates of volatility from an ARCH model earns higher average profits than an investor relying on volatilities implied in asset prices.

Stambaugh explores the efficiency of estimators in the presence of conditional heteroscedasticity. He also suggests additional moment conditions that can be incorporated in generalized method of moments estimators. The additional moment conditions substantially increase the efficiency of estimators relative to ordinary least squares, especially when the conditional heteroscedasticity displays persistence. The estimators are potentially useful in the context of estimating multiperiod returns in financial markets.

Annual April Program Meeting on Public Economics

The NBER's public economics program met in Cambridge on April 14 and 15. The agenda, organized by Program Director James M. Poterba of Stanford University, was:

Jason Cummins and

Kevin A. Hassett, Columbia University, and

R. Glenn Hubbard, NBER and Columbia University, "A Reconsideration of Investment Behavior Using Tax Reforms as Natural Experiments"

Discussant:

William M. Gentry, NBER and Duke University

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

A. Lans Bovenberg, University of Tilburg, "Why Is Capital So Immobile Internationally? Possible Explanations and Implications for Capital Income Taxation"

Discussant:

Kenneth A. Froot, NBER and Harvard University

Martin Feldstein, NBER and Harvard University, and

Marian Vaillant, Harvard University, "Can 'Progressive' State Taxes Redistribute Net Incomes?"

Discussant:

Gilbert E. Metcalf, NBER and Princeton University

Jerry A. Hausman, NBER and

MIT, **Gregory K. Leonard**, Cambridge Economics, Inc., and

Daniel McFadden, University of California, Berkeley, "A Utility-Consistent, Combined Discrete Choice and Count Data Model: Assessing Recreational Use Losses Due to Natural Resource Damage"

Discussant:

Robert Stavins, Harvard University

Jonathan Gruber, NBER and

MIT, "Unemployment Insurance and Consumption Smoothing"

Discussant:

Bruce D. Meyer, NBER and Northwestern University

Robert A. Moffitt, NBER and Brown University, and

Robert Triest, NBER and University of California, Davis, "Taxation and Charity Revisited"

Discussant:

Brigitte Madrian, NBER and Harvard University

Alan J. Auerbach, NBER and University of Pennsylvania, "The U.S. Fiscal Problem: Where We Are, How We Got Here, and Where We're Going" (NBER Working Paper No. 4709. This paper is described in "Ninth Annual Conference on Macroeconomics" in the "Conferences" section of this issue.)

Discussant:

James M. Poterba

Cummins, Hassett, and Hubbard use tax reforms as natural experiments to isolate shocks to firms' marginal investment opportunities. They apply that approach to a panel of firms over 36 years, spanning most of the tax reforms in the postwar period. The estimated adjustment costs are reasonably small. Incorporation of proxies for internal funds does not significantly affect estimates of adjustment costs, but does provide especially strong explanatory power for firms that may not have easy access to capital markets during economic downturns.

Gordon and Bovenberg explore possible explanations for the fact that net capital flows across countries are surprisingly small, and that even gross capital flows are dramatically smaller than would be forecast by existing models of optimal portfolio choice. They find that the only explanation for both observations is asymmetric information between countries. If investors are not well informed when investing abroad, they should do less well on average than local investors, either because they end up being overcharged for securities by local owners or because they invest real resources less well.

Feldstein and Vaillant described their work in progress on

whether states can affect redistribution of income through their income tax systems. They confirm that net wages equilibrate across states. That is, high-skilled employees earn relatively higher wages in states that tax high-wage workers at relatively higher tax rates. So, increasing the progressivity of state taxes will not change the net income distribution.

Hausman and his coauthors outline an approach to assessing the loss of recreational use that can be attributed to natural resource injury. They specify a recreational demand model that addresses both the number of trips and the allocation of trips across recreational sites. Their model takes into account the discrete nature of recreational demand decisions, and should be applicable to a number of consumer choices. The authors estimate the recreational use damages caused by the *Exxon Valdez* oil spill to be approximately \$3.8 million for 1989. These damages may have continued into 1990 and beyond, but the evidence suggests that damage in subsequent years is substantially smaller. However, this estimate does not include damages associated with commercial use, or with so-called nonuse values.

Using data on annual spending

on food for 1968–87, matched to information on the unemployment insurance (UI) benefits provided by each state in each of those years, **Gruber** estimates that a 10 percentage point increase in the UI replacement rate will decrease the expected fall in spending on food at the time of unemployment by 2.6 percent. The average fall in spending on food for the unemployed was 7 percent from 1968–87; Gruber estimates that, without UI, this drop would have been over three times as large. He finds that the positive effect of UI extends for only one period, though, smoothing spending on food at the time of job loss, but having no permanent effect.

Moffitt and Triest report the results of a new examination of the federal tax deduction for charitable giving. They ask whether taxpayers first decide on itemized deductions other than for charity (for example, mortgage interest) and then decide on charitable giving, or whether taxpayers consider all deductions simultaneously. They demonstrate that the question is important for interpreting existing evidence on tax-induced incentives for giving. Some of their preliminary evidence suggests that deductions are chosen simultaneously.

Corporate Finance Program Meets

The NBER's Program in Corporate Finance, directed by Robert W. Vishny of the University of Chicago, met in Cambridge on April 15 to discuss the following papers:

Florencio López-de-Silanes, Harvard University, "Determinants of Privatization Prices"

David Eikenberry, Rice University,

Josef Lakonishok, University of

Illinois, and

Theo Vermaelen, The European Institute of Business Administration, "Market Underreaction to Open Market Share Repurchases" (See "Behavioral Theories of Financial Markets" earlier in this section.)

Paul Gompers, University of Chicago, and

Joshua Lerner, Harvard University, "An Analysis of Compensa-

tion in the U.S. Venture Capital Partnership"

Jason Cummins and **Kevin A. Hassett**, Federal Reserve Board of Governors, and **R. Glenn Hubbard**, NBER and Columbia University, "A Reconsideration of Investment Behavior Using Tax Reforms as Natural Experiments" (See "Program Meeting on Public Economics" earlier in this section.)

Kenneth A. Froot and **James R. Hines, Jr.**, NBER and Harvard University, "Interest Allocation Rules and the Cost of Debt Finance" (See "Taxing Multinational Corporations" in the "Conferences" section of this issue.)

Using data gathered from 346 privatized Mexican companies in 49 industries, **López-de-Silanes** analyzes the determinants of auction prices according to three criteria: 1) company performance and industry parameters; 2) the auction process and its requirements; and 3) the prior restructuring actions taken by the government. He finds that minority control packages carry large discounts. Auction requirements that increase bidder involvement and allow access to foreign

investment result in higher sale prices. The speed of each privatization process partially determines prices: the longer it takes to put the company on the block, the more severe the deterioration in performance, and the lower the premium obtained. Labor cuts, and firing the CEO before the sale, lead to significantly higher premiums. Debt absorption, investment, or programs to improve performance do not increase the net price, while de-investment measures prove more beneficial. Overall, government actions that stimulate bidder participation and expedite the privatization process increase prices.

Gompers and **Lerner** analyze the structure of compensation in U.S. venture capital partnerships. Empirical evidence from 441 U.S. venture capital partnerships formed

between January 1978 and December 1992 is generally consistent with the four primary predictions of their model. Compensation is bunched, with 81 percent of the sample funds sharing in about 20 percent of the profit. The compensation of new and smaller funds shows considerably less variation than that of older and larger funds. The composition of compensation for older and larger funds is significantly more sensitive to performance than compensation for newer and smaller funds. Finally, funds that focus on early stage and high technology investments have higher fixed compensation, consistent with the greater effort required to monitor these projects. The data also show that the market has "evolved" by eliminating fixed fees based on net asset value.

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1851. "Foreign Direct Investment in the United States: Changes Over Three Decades," by **Robert E. Lipsey** (NBER Working Paper No. 4124)

1852. "Alcoholism, Work, and Income," by **John Mullahy** and **Jody L. Sindelar** (NBER Working Paper No. 3909)

1853. "Twenty-Two Years of the NBER-ASA Quarterly Economic Outlook Surveys: Aspects and Comparisons of Forecasting Performance," by **Victor Zarnowitz** and **Phillip Braun** (NBER Working Paper No. 3965)

1854. "Specification and Analysis of a Monetary Policy Rule for Japan," by **Bennett T. McCallum** (NBER Working Paper No. 4449)

1855. "Automobiles and the National Industrial Recovery Act: Evidence on Industry Complementaries," by **Russell W. Cooper** and **John C. Haltiwanger** (NBER Working Paper No. 4100)

1856. "Foreign Firms and Structural Adjustment in Latin America: Lessons from the Debt Crisis," by **Mag-nus Blömmström** and **Robert E. Lipsey** (NBER Working Paper No. 3412)

1857. "Real Exchange Rates and Relative Prices," by **Charles M. Engel** (NBER Working Paper No. 4231)

1858. "Industrial Research During the 1980s: Did the Rate of Return Fall?" by **Bronwyn H. Hall**

1859. "Transitional Dynamics and Economic Growth in the Neoclassical Model," by **Robert G. King** and **Sergio T. Rebelo** (NBER Working Paper No. 3185)

1860. "Tests of Mean-Variance Efficiency of International Equity Markets," by **Charles M. Engel** and **Anthony Rodrigues** (NBER Working Paper No. 2054)

1861. "The Merits of Active Currency Risk Management: Evidence from International Bond Portfo-

lios," by **Richard M. Levich** and **Lee R. Thomas** (NBER Working Paper No. 4340)

1862. "The Significance of Technical Trading-Rule Profits in the Foreign Exchange Market: A Bootstrap Approach," by **Richard M. Levich** and **Lee R. Thomas** (NBER Working Paper No. 3818)

1863. "An Aggregate Demand-Ag-

gregate Supply Analysis of Japanese Monetary Policy, 1973-90," by **Kenneth D. West** (NBER Working Paper No. 3823)

1864. "Targeting the Exchange Rate Under Inflation," by **Shula Pes-sach** and **Assaf Razin** (NBER Working Paper No. 3662)

1865. "Organizational Failure and Transfers in the Public Sector," by

Richard G. Frank and **Martin Gay-nor** (NBER Working Paper No. 3923)

1866. "Permanent and Transitory Components of GNP and Stock Prices," by **John H. Cochrane** (NBER Working Paper No. 3427)

1867. "Competitive Diffusion," by **Boyan Jovanovic** and **Glenn M. MacDonald** (NBER Working Paper No. 4463)

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"Measuring the Performance of a Protected Infant Industry: The Case of Brazilian Microcomputers," by **Ed-uardo Luzio** and **Shane Green-stein**

"Models of the Transition in Eastern Europe with Untransferable Eastern Capital," by **Edward E. Leamer**

"Utilitarian Trade-Off Between Population Growth and Income Growth," by **Assaf Razin** and **Chi-Wa Yuen**

"King Kong Meets Godzilla: The World Bank and *The East Asian Miracle*," by **Dani Rodrik**

"Love and Hate: State and Nonstate Firms in Transition Economies," by **Shang-Jin Wei** and **Peng Lian**

"Modeling Parking," by **Richard J. Arnott** and **John Rowse**

"Monetary Regimes, Inflation, and Monetary Reform: An Essay in Honor of Axel Leijonhufvud," by **Michael D. Bordo** and **Lars Jonung**

"Financial Links Around the Pacific Rim: 1982-92," by **Menzie David Chinn** and **Jeffrey A. Frankel** (*Exchange Rate Policy and Interdependence: Perspectives from the Pacific Basin*, R. Glick and M. Hutchinson, eds. Cambridge University Press, forthcoming)

"Is Japan Establishing a Trade Bloc in East Asia and the Pacific?" by **Jeffrey A. Frankel** (*Regionalism and Rivalry: Japan and the United States in Pacific Asia*, Jeffrey A. Frankel and Miles Kahler, eds. Chicago: University of Chicago Press, 1993)

"The U.S. Fiscal Problem: Where We Are, How We Got Here, and Where We're Going: A Comment," by **Martin Feldstein**

Bureau Books

Eighth Tax Volume Is Published

Tax Policy and the Economy, Volume 8, edited by James M. Poterba, is now available from the MIT Press. This volume of papers presented at an NBER conference held in November 1993 examines: the effect of various welfare programs on the well-being of children; how to measure the burden of a value added tax; the influence of taxes on the R and D activities of multinational firms; the efficiency and environmental consequences of new energy taxes; and, the economic costs of energy taxes in the face of imperfect competition among firms.

Poterba is the director of the NBER's Program of Research in Public Economics and a professor of economics at MIT.

This volume, which should have broad appeal, is priced at \$14.95 for the paperback edition or \$27.95 for the hardcover edition. It should be ordered directly from The MIT Press, 55 Hayward Street, Cambridge, MA 02142; (617) 625-8567 or 1-800-356-0343.

Working Under Different Rules

Working Under Different Rules, edited by Richard B. Freeman, compares labor markets and transfer programs in the United States and Western Europe, Canada, Japan, and Australia, and assesses which programs and policies work best. The papers—on unions, wage setting, apprenticeship programs, welfare support, and works councils—describe alternative ways of training, paying, and representing American workers. This timely and accessible work, which provides nontechnical summaries of research done in several NBER projects conducted with the help of the Ford Foundation, will interest anyone concerned with labor studies or social policy.

Freeman is the director of the NBER's Program in Labor Studies and the Herbert Ascherman Professor of Economics at Harvard University.

The clothbound volume sells for \$39.95, and the paperback edition for \$14.95. Either should be ordered directly from the Russell Sage Foundation, 112 East 64th Street, New York, NY 10021; 1-800-666-2211. Orders from individuals must be prepaid. Include \$3.00 shipping and handling for orders within the United States; \$4.00 for foreign orders. New York state residents add 8 percent sales tax; Canadian residents add 7 percent GST.



The following volumes may be ordered directly from the University of Chicago Press, Order Department, 11030 South Langley Avenue, Chicago, IL 60628-2215. Academic discounts of 10 percent for individual volumes and 20 percent for standing orders for *all* NBER books published by the University of Chicago Press are available to university faculty; orders must be sent on university stationery.

Social Protection vs. Economic Flexibility

Part of the Bureau's new series in labor studies, ***Social Protection vs. Economic Flexibility***, edited by Rebecca M. Blank, can be ordered from the University of Chicago Press for \$45.00. This volume compares social programs in a number of countries, including the United States, and concludes that such programs do not explain the high unemployment in Europe, nor the lack of adjustment of labor markets to changing economic conditions. The various papers, originally presented at an NBER conference, focus on: advance notice and severance pay requirements in Germany, France, and Belgium; the relationship between labor mobility and labor flexibility in Japan and the United States; tenant protection regulation and homeownership subsidies in the United States, Germany, and Japan; employer-provided health insurance and public pension plans; public sector jobs and labor market flexibility; and time-limited welfare programs in France. This volume is written for a wide audience interested in some

of the most pressing issues of our time. Blank is a research associate in the NBER's Program in Labor Studies and a professor of economics at Northwestern University.

Training and the Private Sector

A second labor studies volume from the University of Chicago Press, ***Training and the Private Sector***, edited by Lisa M. Lynch, is priced at \$47.00. The papers in this book, also originally presented at an NBER conference, describe training and apprenticeship programs in Germany, Japan, the United States, the United Kingdom, Norway, and the Netherlands. Then the effect of these programs on productivity, jobs, and wages in the various countries is discussed. According to Lynch, this volume should be of interest to experts in human resources, labor economists, and anyone concerned about the skills of the American workforce. Lynch also is an NBER research associate in labor studies, and a professor of economics at Tufts University.

The Transition in Eastern Europe

The Transition in Eastern Europe, Volumes 1 and 2, edited by Olivier J. Blanchard, Kenneth A. Froot, and Jeffrey D. Sachs, is available from the University of Chicago Press. These two volumes analyze the situation in various newly independent countries in order to identify common progress, difficulties, and tentative solutions to the problems of transition to market econo-

mies. Volume I examines the experiences of Poland, Czechoslovakia, Hungary, Germany, Slovenia, and Russia; it costs \$39.95. Volume II discusses Eastern Europe's fiscal reform, labor market structure, the design of privatization, bankruptcy mechanisms, and the role of foreign direct investment; it costs \$48.00. This book, the result of a conference in Cambridge that brought together academic specialists with government officials from the countries undergoing change, should be useful to economists and policymakers in both eastern and western countries, and to international agencies concerned with the transition process. Blanchard is a research associate in the NBER's Program in Economic Fluctuations and a professor of economics at MIT; Froot is a research associate in the Bureau's international finance and macroeconomics program and a professor at the Harvard Business School; and Sachs is a research associate in both NBER programs and a professor of economics at Harvard University.

Housing Markets in the U.S. and Japan

Housing Markets in the U.S. and Japan, edited by Yukio Noguchi and James M. Poterba, may be ordered from the University of Chicago Press for \$40.00. The ten papers in this NBER conference report provide statistics on, and comparisons of, housing markets in the two countries. The five pairs of papers—one by a Japanese and one by an American scholar—discuss land and house prices; housing and financial markets; housing markets and the journey to work; housing and saving; and public

policies toward housing markets. This book should interest economists, business people, and anyone who would like to know more about contemporary Japan.

Poterba is the director of the NBER's Program in Public Economics and a professor at MIT. Noguchi is a professor of economics at Hitotsubashi University.

Public Policies and Household Saving

Public Policies and Household Saving, edited by James M.

Poterba, is available from the University of Chicago Press for \$36.00. The seven papers in this NBER Project Report present a systematic study of saving policies in the G-7 industrialized countries: the United States, Canada, the United Kingdom, Germany, Italy, Japan, and France. Each study includes information on the asset composition of household net worth; describes the tax treatment of capital income; discusses retirement saving, pensions, and other targeted saving programs; and details the role of insurance contracts in saving. This book should be of particular interest to policymakers as a source of information on various policies toward saving.

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Journal of Economic Literature (JEL) subject codes, when available, are listed after the date of the paper, followed by the program(s) of research represented by each paper. Papers not associated with an NBER program are listed as Miscellaneous. All Historical Factors in Long-Run Growth Papers are in the Development of the American Economy program.

Abstracts of all papers issued since February 1994 are presented below. For previous papers, see past issues of the *NBER Reporter*. Working Papers are intended to make results of NBER research available to other economists in preliminary form to encourage discussion and suggestions for revision before final publication. They are not reviewed by the Board of Directors of the NBER.

NBER Working Papers

Intellectual Capital and the Birth of U.S. Biotechnology Enterprises

Lynne G. Zucker, Michael R. Darby, and Marilynn B. Brewer

NBER Working Paper No. 4653

February 1994

JEL No. L11

Productivity

We examine the relationship among the intellectual capital of scientists who make frontier discoveries, the presence of great university bioscience programs, the presence of venture capital firms, other economic variables, and the founding of U.S. biotechnology enterprises during 1976–89. We find that the timing and location of the birth of biotech enterprises is determined primarily by intellectual capital measures, particularly the local number of highly productive “star” scientists actively publishing genetic science discoveries. Great universities are likely to grow and recruit star scientists, but their effect is separable from the universities. At least early in the process, star scientists appear to be the scarce, immobile factors of production. Our focus on intellectual capital is related to knowledge spillovers, but in this case “natural excludability” permits capture of supranormal returns by scientists. Given this reward structure, technology transfer was vigorous without any special intermediating structures. We believe biotechnology may be prototypical of the birth patterns in other innovative industries.

Asset Sales, Firm Performance, and the Agency Costs of Managerial Discretion

Larry Lang, Annette Poulsen, and René M. Stulz

NBER Working Paper No. 4654

February 1994

Asset Pricing, Corporate Finance

We argue that management will sell assets when doing so provides the cheapest funds for pursuing its objectives, rather than for reasons of operating efficiency alone. This suggests that: 1) firms selling assets have high leverage and/or poor performance; 2) a successful asset sale is good news; and 3) the stock market discounts the proceeds of asset sales that are retained by the selling firm. We find that the typical firm in our sample performs poorly before the sale, and that the average stock price reaction to asset sales is positive only when the proceeds are paid out.

Relative Returns on Equities in Pacific Basin Countries

Charles M. Engel and John H. Rogers

NBER Working Paper No. 4655

February 1994

JEL Nos. F3, F4

International Finance and Macroeconomics

We examine the factors that determine differences in ex ante returns on equities in eleven Pacific Basin countries. Our concern is whether differentials in real return are caused primarily by differentials in nominal return or by expected changes in real exchange rates. We find that differentials in nominal return account for most of the difference; this suggests either that there is not free mobility of capital among the countries of our study, or that there are significant

differences in the riskiness of returns across countries. We do not find a significant relationship between the size of the return differentials and the flexibility of the nominal exchange rate.

On the Need for Fiscal Discipline in a Union

Joshua Aizenman

NBER Working Paper No. 4656

February 1994

JEL Nos. F5, F42

International Finance and Macroeconomics

This paper investigates the behavior of public debt in countries forming a union (such as is outlined by the Maastricht Treaty). We consider a federal union of states where the center has limited control over the spending patterns of the union members and where the union members' behavior has repercussions for the future public debt. The public has preferences against higher public debt, and will oust high-debt administrations. Adverse shocks induce a regime switch from a cooperative outcome to limited cooperation, and from limited cooperation to the noncooperative outcome. While a transitory adverse shock calls for a higher public debt in the cooperative regime, the switch toward limited cooperation entails a drop in the public debt (relative to the cooperative desirable outcome). With limited cooperation, further drops in income will call for a *drop* in public debt. If the adverse shock is powerful enough, sustaining limited cooperation may become unfeasible. A regime switch may yield nonlinearities, in which the macroeconomic behavior is altered abruptly following the switch. Our model tentatively supports limits on public debt, needed to free the instrument of deficit financing for use in bad recessions.

A Test of the International CAPM Using Business Cycles Indicators as Instrumental Variables

Bernard Dumas

NBER Working Paper No. 4657

February 1994

JEL Nos. G11, G12, G15

Asset Pricing, International Finance and Macroeconomics

Previous work by Dumas and Solnik (1993) has shown that a Capital Asset Pricing Model (CAPM) that incorporates foreign exchange risk premiums (a so-called "international CAPM") is better able to explain the structure of worldwide rates of return than the classic CAPM. In this paper, I use as instruments economic variables that are "external" to the financial market, such as leading indicators of the business cycles. This is an attempt to explain the behavior of the international stock market on the basis of economically meaningful variables that capture "the state of the economy." I find that the leading indicators put together by Stock and Watson as predictors of the U.S. business cycle also predict stock returns in the United States, Germany, Japan, and the United Kingdom. These instruments again lead to a rejection of the classic CAPM, and no rejection of the international CAPM.

Sources of Real Exchange Rate Fluctuations: How Important Are Nominal Shocks

Richard H. Clarida and Jordi Gali

NBER Working Paper No. 4658

February 1994

International Finance and Macroeconomics

We investigate the sources of real exchange rate fluctuations since

the collapse of Bretton Woods. Our main contribution is to build and estimate a three-equation macro-model in the spirit of Dornbusch (1976) and Obstfeld (1985), and to identify the model's structural shocks to demand, supply, and money, using the approach pioneered by Blanchard and Quah (1989). For Germany and Japan, our structural estimates imply that monetary shocks, to the money supply as well as to the demand for real money balances, explain a substantial amount of the variance of real exchange rates relative to the dollar. We find that demand shocks to national saving and investment explain the majority of the variance in real exchange rate fluctuations, while supply shocks explain very little. The model's estimated short-run dynamics are strikingly consistent with the predictions of the simple textbook Mundell-Fleming model.

Balanced and Unbalanced Growth

James E. Rauch

NBER Working Paper No. 4659

February 1994

JEL Nos. F43, O11, O41

International Trade and Investment

In this paper, I develop a mechanism of endogenous growth suitable for investigating sectoral or regional interaction. I show how the value placed on production linkages by economic historians might be reconciled with the value placed on openness (which often implies lack of linkages) by observers of contemporary less developed countries. When the output of one sector is traded and the output of the other is nontraded, then the traded goods sector acts as the "engine of growth," in the sense that its profitability of knowledge acquisition primarily determines

the steady-state aggregate growth rate. I also show how sectors or regions interact through product, labor, and capital markets; if the former interaction dominates, the growth of one sector "pulls along" the growth of the other, while if the latter two interactions dominate, then one sector or region booms while the other declines. Building on these results, I show why liberalization of foreign trade should lead to a transition from a lower to a higher steady-state growth rate and why, during this transition, growth initially might be even slower than before liberalization. On this basis, I reinterpret the post-1973 economic performance of Chile. A final application to economic integration of previously separate regions or countries shows that the largest growth effects occur if one region is allowed to decline and provide a source of cheap labor for the other region.

What Determines Expected International Asset Returns?

Campbell R. Harvey, Bruno Solnik, and Guofu Zhou

NBER Working Paper No. 4660

February 1994

JEL Nos. F3, G0, G1

Asset Pricing

This paper characterizes the forces that determine time variation in expected international asset returns. By using the latent-factor technique, we do not have to pre-specify the sources of risk. We find that the first factor premium resembles the expected return on the world market portfolio. However, the inclusion of this premium alone is not sufficient to explain the conditional variation in the returns. There is a second factor premium related to foreign exchange risk. Our sample includes new data on

international industry and fixed-income portfolios. We find that the two-latent-factor model better explains the conditional variation in asset returns than a prespecified two-factor model. Finally, we show that differences in the risk loadings are important in accounting for the cross-sectional variation in the international returns.

Fixed Exchange Rates, Inflation, and Macroeconomic Discipline

Sebastian Edwards and Fernando J. Losada

NBER Working Paper No. 4661
February 1994
International Finance and Macroeconomics

We use data from Guatemala and Honduras to investigate some long-run implications of the Purchasing Power Parity theory. In particular, we address two questions: to what extent did the fixed exchange rate regime impose macroeconomic discipline on these countries; and what was the impact of terms-of-trade shocks and growth differentials on inflation rate differentials between those countries and the United States? We find that the fixed parities regime worked properly until the mid-1970s, providing some constraint on central bank behavior. However, the fixed exchange rate system was not sufficient to avoid inflation outbursts and balance-of-payments crises. Specifically, it was unable to accommodate large negative terms-of-trade shocks in the late 1970s and early 1980s.

Do Youths Substitute Alcohol and Marijuana? Some Econometric Evidence

Frank J. Chaloupka and Adit Laixuthai

NBER Working Paper No. 4662
February 1994
JEL No. I1
Health Economics

We use data from the 1982 and 1989 "Monitoring the Future" surveys to examine the substitutability of alcoholic beverages and marijuana among youths. Beer prices and minimum legal drinking ages are used to measure the full price of alcohol, while the money price of marijuana and an indicator of decriminalization capture the full price of marijuana. Our results indicate that drinking frequency and heavy drinking episodes are related negatively to beer prices, but positively to the full price of marijuana. We examine the implications of this substitution for driving while intoxicated, using information on nonfatal accidents of youth taken from the surveys, and on fatal motor vehicle accidents of youth constructed from the Fatal Accident Reporting System. These results indicate that the net effect of an increase in the full price of alcoholic beverages on the probability of a traffic crash involving youth is negative. However, the opposite is found for marijuana. That is, the reduction in accidents resulting from substitution away from alcoholic beverages and other intoxicating substances to marijuana as its full price declines more than offsets the increase in accidents related to marijuana use.

The Impact of the Federal Reserve Bank's Open Market Operations

Campbell R. Harvey and Roger D. Huang

NBER Working Paper No. 4663
February 1994
JEL Nos. G0, G1, E0
Asset Pricing, Monetary Economics

The Federal Reserve System has the ability to change the money supply and to shape the expectations of market participants through its open market operations. These operations may amount to 20 percent of the day's volume, and are concentrated during the half hour known as "Fed Time." Using previously unavailable data on open market operations, we provide the first comprehensive examination of the impact of the Federal Reserve's trading on both fixed-income instruments and foreign currencies. Our results detail a dramatic increase in volatility during Fed Time. Surprisingly, the volatility during Fed Time is higher on days when there are no open market operations. In addition, we observe little systematic differences in market impact for reserve-draining versus reserve-adding operations. These results suggest that the financial markets correctly anticipate the purpose of open market operations, but are unable to forecast the timing of the operations.

Updated Notes on the Interindustry Wage Structure

Steven G. Allen

NBER Working Paper No. 4664
February 1994
JEL Nos. J3, J5
Labor Studies

This paper documents and analyzes changes in the wage structure

across manufacturing industries over the last 100 years. Interindustry differentials in wages are highly stable for production workers, but less so for nonproduction workers. Industry wage patterns are very similar for production and nonproduction workers today, but this has been true only since 1958. Dispersion of wages across industries has shown varying trends over the last 100 years, but never has been higher than it is today. The variables that are most strongly correlated with wage growth are productivity growth, rising union density, rising capital intensity, and profit growth.

The Consequences of Population Aging on Private Pension Fund Saving and Asset Markets

Sylvester J. Schieber and John B. Shoven

NBER Working Paper No. 4665

March 1994

JEL Nos. J14, G23, E20

Aging, Public Economics

This paper examines the impact of the aging demographic structure of the United States on its funded private pension system. We produce a 75-year outlook for the pension system corresponding to the 75-year forecast of the Social Security system. Our primary result is that the pension system will cease being a source of national saving in the third decade of the next century. We speculate about the impact this may have on asset prices.

The Impact of Demographics on Housing and Nonhousing Wealth in the United States

Hilary Williamson Hoynes and Daniel McFadden

NBER Working Paper No. 4666

March 1994

JEL Nos. D91, E21

Aging

Equity in housing is a major component of household wealth in the United States. Steady gains in housing prices over the last several decades have generated large potential gains in household wealth among homeowners. Mankiw and Weil (1989) and McFadden (1993) have argued that the aging of the U.S. population is likely to induce substantial declines in housing prices, resulting in capital losses for future elderly generations. However, if households can anticipate changes in housing prices, and if they adjust their nonhousing savings accordingly, then welfare losses in retirement could be mitigated.

This paper focuses on two questions: 1) Can housing prices be forecast from current information on demographics and housing prices? 2) How are household savings decisions affected by capital gains in housing? We use metropolitan statistical area-level data on housing prices and demographic trends during the 1980s and find mixed evidence on the forecastability of housing prices. Further, we use data on five-year savings rates from the Panel Study of Income Dynamics and find no evidence that households change their nonhousing savings in response to expectations about capital gains in housing. Thus, the projected decline in housing prices could result in large welfare losses to current homeowners and large intergenerational differences in equity.

Do Repatriation Taxes Matter? Evidence from the Tax Returns of U.S. Multinationals

Rosanne Altshuler, T. Scott Newlon, and William C. Randolph

NBER Working Paper No. 4667

March 1994

JEL Nos. H32, H25, H87

Public Economics

Do repatriation taxes influence whether the profits of foreign subsidiaries are repatriated or reinvested abroad? Theoretical models suggest that dividend remittances should not be influenced by repatriation taxes. Recent empirical work indicates that dividend remittances *are* sensitive to repatriation taxes. This paper investigates whether the empirical evidence can be reconciled with the theoretical results by recognizing that repatriation taxes on dividends may vary over time, providing firms with an incentive to time repatriations so that they occur in years when repatriation rates are relatively low.

We use information about cross-country differences in tax rates to estimate separately the influence of permanent tax changes, as would occur with changes in statutory tax rates, versus transitory tax changes on dividend repatriations. Our data contain U.S. tax return information for a large sample of U.S. corporations and their foreign subsidiaries. We find that the permanent tax price effect is significantly different from the transitory price effect, and is not significantly different from zero; the transitory tax price effect is negative and significant. This suggests that repatriation taxes *do* affect dividend repatriation, but only to the extent that they vary over time. Previous empirical work apparently has measured the effect of timing.

The Effects of Outbound Foreign Direct Investment on the Domestic Capital Stock

Martin Feldstein

NBER Working Paper No. 4668

March 1994

JEL Nos. H2, H87, F21

International Trade and Investment,

Public Economics

This paper analyzes the effect of outbound foreign direct investment (FDI) on the domestic capital stock. The first part of the paper shows that only about 20 percent of the value of assets owned by U.S. affiliates abroad is financed by cross-border flows of capital from the United States. An additional 18 percent represents retained earnings attributable to U.S. investors. The rest is financed locally by foreign debt and equity. The second part of the paper analyzes data for the major industrial countries of the OECD, and finds that each dollar of cross-border flow of FDI reduces domestic investment by approximately one dollar. This dollar-for-dollar displacement of domestic investment by outbound FDI is consistent with the Feldstein-Horioka picture of segmented capital markets. It suggests that while portfolio funds are largely segmented into national capital markets, direct investment can achieve cross-border capital flows. A dollar outflow of direct investment reduces domestic investment by a dollar; this is not offset by a change in international portfolio investment. This ability of FDI to circumvent the segmented national capital markets also appears in the expanded use of foreign debt and equity capital to finance the capital accumulation of foreign affiliates of U.S. firms.

Taken together, these estimates suggest that each dollar of foreign

assets acquired by U.S. foreign affiliates reduces the U.S. domestic capital stock by between 20 cents and 38 cents. Equivalently, this implies that each dollar of displaced domestic capital in the United States adds between \$2.60 and \$5.00 to the capital stock of U.S. foreign affiliates.

Do Teachers' Race, Gender, and Ethnicity Matter? Evidence from NELS88

**Ronald G. Ehrenberg,
Daniel D. Goldhaber, and
Dominic J. Brewer**

NBER Working Paper No. 4669

March 1994

JEL Nos. I2, J0

Labor Studies

Our study uses a unique survey, the National Educational Longitudinal Study of 1988 (NELS), which permits researchers to match individual students and teachers and to analyze how a teacher's race, gender, and ethnicity influence students from both the same and different races, genders, and ethnic groups. In contrast to much of the previous literature, our paper focuses both subjectively on how teachers relate to and evaluate their students *and* objectively on how much their students learn.

On balance, we find that teachers' race, gender, and ethnicity are much more likely to influence teachers' subjective evaluations of their students than to influence how much the students learn objectively. For example, while there does *not* appear to be an association with larger increases in test scores for white female students in mathematics and science with white female teachers than with white male teachers, the white female teachers do give higher subjective evaluations of their white female students than their white male counterparts do.

Household Demand for Garbage and Recycling Collection with the Start of a Price Per Bag

**Don Fullerton and
Thomas C. Kinnaman**

NBER Working Paper No. 4670

March 1994

JEL Nos. D62, H23, H24

Public Economics

This paper estimates household reaction to the implementation of unit pricing for the collection of residential garbage. We gather original data on weight and volume of weekly garbage and recycling for 75 households in Charlottesville, Virginia, both before and after the start of a program that requires an 80-cent sticker on each bag of garbage. This dataset is the first of its kind. We estimate household demands for the collection of garbage and recyclable material, the effect on density of household garbage, and the amount of illegal dumping by households. We also estimate the probability that a household chooses each method available to reduce its garbage.

We find that, in response to the implementation of this unit pricing program, households: 1) reduced the weight of their garbage by 14 percent; 2) reduced the volume of garbage by 37 percent; and 3) increased the weight of their recyclable materials by 16 percent. We estimate that additional illegal—or at least suspicious—disposal accounts for 0.42 pounds per person per week, or 28 percent of the reduction in garbage observed at the curb.

Quality Change and Other Influences on Measures of Export Prices of Manufactured Goods and the Terms of Trade Between Primary Products and Manufactures

Robert E. Lipsey

NBER Working Paper No. 4671

March 1994

JEL Nos. E30, F10

International Trade and Investment

Measures of long-term trends in world export prices of manufactured goods, and in the terms of trade between manufactured goods and primary products, are sensitive to the choice of country weights and base periods and, most important of all, to the treatment of quality change. Later base periods and higher weights for rapidly growing exporters, such as Japan or the newly industrializing East Asian countries, are associated with lower estimates of the long-term increase in prices.

Conservative estimates of the bias in the most commonly used measure of export prices of manufactured products, the United Nations export unit value index for manufactures, suggest that this measure overstates the long-run rise in manufactured goods prices by more than 0.5 percent per year, probably by 1 percent or more. If this is the case, then there has been no long-term trend toward rising prices of manufactures relative to primary products. However, no conceivable estimate of bias in measures of manufactured goods prices would reverse the picture of declining relative primary product prices during the 1980s.

The Changing Labor Market Position of Canadian Immigrants

David E. Bloom, Gilles Grenier, and Morley Gunderson

NBER Working Paper No. 4672

March 1994

JEL Nos. J15, J31

Labor Studies

This paper uses pooled 1971, 1981, and 1986 Canadian census data to evaluate the extent to which the earnings of Canadian immigrants, when they immigrate, fall short of the earnings of comparable Canadian-born individuals, and whether immigrants' earnings grow more rapidly over time than those of the Canadian-born. We also analyze variations in the labor market assimilation of immigrants according to their gender and country of origin. The results suggest that recent waves of immigrants have had more difficulty being assimilated into the Canadian labor market than earlier ones, an apparent consequence of recent changes in Canadian immigration policy, labor market discrimination against visible minorities, and the prolonged recession of the early 1980s.

The Impact of Prenatal Exposure to Cocaine on Newborn Costs and Length of Stay

Theodore J. Joyce, Andrew D. Racine, Sandra McCalla, and Hassan Wehbeh

NBER Working Paper No. 4673

March 1994

JEL No. I12

Health Economics

This paper determines newborn costs and lengths of stay attributable to prenatal exposure to cocaine and other illicit drugs. Our data source is deliveries at a large municipal hospital in New York

City between November 18, 1991 and April 11, 1992. We analyze differences in costs and length of stay between infants exposed and not exposed prenatally to cocaine and other illicit drugs, adjusting for maternal race, age, prenatal care, tobacco use, parity, type of delivery, birthweight, prematurity, and newborn infection. Urine specimens, with linked obstetric sheets and discharge abstracts, provide information on drug exposure, prenatal behavior, costs, length of stay, and discharge disposition. Our principal findings are that infants exposed to cocaine and some other illicit drug stay approximately seven days longer, at a cost of \$7731 more, than infants not exposed. Approximately 60 percent of these costs are indirect, the result of adverse birth outcomes and newborn infection. Hospital screening as recorded on discharge abstracts substantially underestimates prevalence at delivery, but overestimates its impact on costs.

Developments in Collective Bargaining in Construction in the 1980s and 1990s

Steven G. Allen

NBER Working Paper No. 4674

March 1994

JEL Nos. J4, J5

Labor Studies

This paper summarizes important developments in collective bargaining in the construction industry in the 1980s and 1990s. Workers in the industry have experienced high unemployment and a 17 percent drop in real wages. Union density has declined from 31 percent in 1981 to 22 percent in 1992, despite a sizable drop in the union-nonunion differential in wages and a tremendous reduction in the number of strikes. The main

reasons for the decline in union strength are the adoption of strategies by contractors and owners to control labor costs, and changes in the interpretation of labor laws that have given contractors more flexibility in determining their collective bargaining status.

Factor Hoarding and the Propagation of Business Cycle Shocks

**Craig Burnside and
Martin Eichenbaum**

NBER Working Paper No. 4675

March 1994

JEL No. E3

Economic Fluctuations

This paper analyzes the role of variable capital utilization rates in propagating shocks over the business cycle. We formulate and estimate an equilibrium business cycle model in which cyclical capital utilization rates are viewed as a form of factor hoarding. We find that variable rates of capital utilization substantially magnify and propagate the impact of shocks to agents' environments. The strength of these propagation effects is evident in the dynamic response functions of various economywide aggregates to shocks in agents' environments, in the statistics that we construct to summarize the strength of the propagation mechanisms in the model, and in the volatility of exogenous technology shocks needed to explain the observed variability in aggregate U.S. output. Other authors have argued that standard Real Business Cycle models fail to account for certain features of the data, because they do not embody quantitatively important propagation mechanisms. These features include the observed positive serial correlation in the growth rate of output, the shape of the spectrum of the growth rate of real

output, and the correlation between the forecastable component of real output and various other economic aggregates. Allowing for variable capital utilization rates substantially improves the ability of the model to account for these features of the data.

Reverse Engineering the Yield Curve

**David K. Backus and
Stanley E. Zin**

NBER Working Paper No. 4676

March 1994

JEL Nos. E43, G12, G13

Asset Pricing

Prices of riskfree bonds in any arbitrage-free environment are governed by a pricing kernel: given a kernel, we can compute the prices of bonds of any maturity we like. We use observed prices of multiperiod bonds to estimate the pricing kernel that gave rise to them. The high-order dynamics of our estimated kernel help to explain why first-order, one-factor models of the term structure have had difficulty reconciling the shape of the yield curve with the persistence of the short rate. We use the estimated kernel to provide a new perspective on Hansen-Jagannathan bounds, the price of risk, and the pricing of bond options and futures.

A Sticky-Price Manifesto

**Laurence M. Ball and
N. Gregory Mankiw**

NBER Working Paper No. 4677

March 1994

Economic Fluctuations,
Monetary Economics

Macroeconomists are divided on the best way to explain short-run economic fluctuations. We present the case for traditional theories based on short-run price stickiness.

We discuss the fundamental basis for believing in this class of macroeconomic models, as well as recent research on the macroeconomic foundations of sticky prices.

International Differences in Male Wage Inequality: Institutions Versus

**Francine D. Blau and
Lawrence M. Kahn**

NBER Working Paper No. 4678

March 1994

JEL No. J3

Labor Studies

While changes in the demand for skilled labor appear to have led to a widening of the wage structures in many countries during the 1980s, considerable differences in the *level* of wage inequality remain. In this paper we examine the sources of these differences, focusing primarily on the level of wage inequality in the United States. We find that the greater overall dispersion of the U.S. wage distribution reflects considerably more compression at the bottom of the distribution in the other countries, but relatively little difference in the degree of wage inequality at the top. While differences in the distribution of measured characteristics help to explain some aspects of the international differences, U.S. labor market prices—that is, higher rewards to labor market skills—are an important factor. Labor market institutions, chiefly the relatively decentralized wage-setting mechanisms in the United States compared to other countries, appear to provide the most persuasive explanation for these international differences in prices. In contrast, the pattern of cross-country differences in relative supplies of and demands for skills does not appear to be consistent with the pattern of observed differences in wage inequality.

Minimum Wage Effects on Employment and School Enrollment

David Neumark and William Wascher

NBER Working Paper No. 4679

March 1994

JEL No. J21, J24, J33

Labor Studies

We argue that the focus on employment effects in recent studies of minimum wages ignores an important interaction between schooling, employment, and the minimum wage. To study these linkages, we estimate a model of employment and enrollment for teenagers, using observations for 1977 to 1989. The results show a negative influence of minimum wages on school enrollment, and a positive effect on the proportion of teens neither employed nor in school. We further suggest that our results are consistent with substitution by employers of higher- for lower-skilled teenagers, with the displaced teens ending up both out of work and out of school.

The Tyranny of Numbers: Confronting the Statistical Realities of the East Asian Growth Experience

Alwyn Young

NBER Working Paper No. 4680

March 1994

Growth, International Trade and Investment

This paper documents the fundamental role played by factor accumulation in explaining the extraordinary postwar growth of Hong Kong, Singapore, South Korea, and Taiwan. Participation rates, educational levels, and (with the exception of Hong Kong) investment rates have risen rapidly in all four economies. In addition, there have been large intersectoral realloca-

tions of labor, with (again, excepting Hong Kong) nonagricultural and manufacturing employment growing one-and-a-half to two times as fast as the aggregate working population. Thus, while the growth of output per capita in these economies has averaged 6 percent to 7 percent per annum over the past two-and-a-half decades, the growth of output per effective worker in the nonagricultural sector has been only 3 percent to 4 percent per annum. Allowing for the doubling, tripling, and even quadrupling of the investment-to-GDP ratio in these economies, total factor productivity growth rates for the nonagricultural economy and manufacturing in particular, are well within the bounds of those experienced by the OECD and Latin American economies over equally long periods of time. While the growth of output and manufacturing exports in the newly industrializing economies of East Asia is virtually unprecedented, the growth of total factor productivity in these economies is not.

Policy, Technology Adoption, and Growth

William Easterly, Robert G. King, Ross Levine, and Sergio T. Rebelo

NBER Working Paper No. 4681

March 1994

JEL Nos. O40, E62, O1

Growth

We describe a simple model of technology adoption that combines two engines of growth: human capital accumulation and technological progress. In our model, the economy does not create new technologies; it simply adopts those that have been created elsewhere. Accumulating human capital simply means learning how to incorporate a new intermediate

good into the production process. Since adoption costs are proportional to the labor force, our model does not display the counterfactual effects on scale that are standard in models with endogenous technical progress. Our model is compatible with various standard results on the effects of economic policy on the rate of growth.

International R and D Spillovers Between U.S. and Japanese R and D-Intensive Sectors

Jeffrey I. Bernstein and Pierre Mohnen

NBER Working Paper No. 4682

March 1994

JEL Nos. O3, C51

Growth

A country's production structure and productivity growth depend on its own R and D capital formation. With the growing role of international trade, foreign investment, and international diffusion of knowledge, domestic production and productivity also depend on the R and D activities of other countries. This paper investigates the bilateral link between the U.S. and Japanese economies in terms of how capital formation in one country affects the production structure, physical and R and D capital accumulation, and productivity growth in the other country.

We find that production processes become less labor intensive as international R and D spillovers grow. In the short run, R and D intensity is complementary to the international spillover. This relationship persists in the long run for the United States, but the Japanese decrease their own R and D intensity. U.S. R and D capital accounts for 60 percent of Japanese total factor productivity growth, while Japanese R and D capital contributes 20

percent to U.S. productivity gains. International spillovers cause social rates of return to be about four times the private returns.

Foreign Direct Investment, Employment Volatility, and Cyclical Dumping

Joshua Aizenman

NBER Working Paper No. 4683

March 1994

JEL Nos. F12, F15, F23

International Trade and Investment

This paper analyzes the impact of foreign direct investment (FDI) on patterns of cyclical dumping (exporting at a price below marginal cost). I consider a global economy where manufacturing is monopolistic-competitive, and productivity is subject to country-specific shocks. Labor is risk averse and immobile across countries; entrepreneurs are risk neutral. Labor employment and income are governed by implicit contracts, which offer stable real income and volatile employment. Capacity investment is irreversible, and is completed prior to the resolution of uncertainty. If investment in manufacturing capacity is characterized by returns to scale, then higher volatility of productivity shocks induces producers to diversify internationally through FDI. The resultant integrated equilibrium is characterized by greater volatility of employment, as the multinational company effectively reallocates employment from a country with low realized productivity to a country with high realized productivity. Cyclical dumping occurs when the percentage shortfall of the realized employment exceeds the inverse of the demand elasticity. Cyclical dumping is more frequent in industries that are more competitive and more labor intensive. FDI both improves welfare and increases the incidences of cyclical dumping.

Wage Inequality and Industrial Change: Evidence from Five Decades

Chinhui Juhn

NBER Working Paper No. 4684

March 1994

JEL Nos. J23, J31

Labor Studies

Using data from the 1940–80 Decennial Census and the 1988–92 March Current Population Surveys, I examine the impact of industrial change on male wage inequality over five decades (1940–90). Alternative measures of skill, such as the wage percentile, education, and occupation indicate that wage inequality between more- and less-skilled male workers fell substantially during the 1940s and increased most dramatically during the 1980s. Examination of industrial change over this longer time period shows that the demand for the most highly educated and skilled male workers relative to the least-skilled male workers increased no faster during the 1970s and the 1980s than during the earlier decades. In contrast, the demand for men in the middle-skill categories (such as those in basic manufacturing) expanded during the 1940s and the 1950s, and contracted severely during the 1970s and 1980s. This suggests that the growth of jobs in the middle-skill categories may be related closely to overall wage inequality. Cross-sectional regressions based on state level data also show some empirical support for the hypothesis that a decline in the demand for medium-skilled groups increases overall wage inequality.

Accounting Standards, Information Flow, and Firm Investment Behavior

Jason G. Cummins, Trevor S. Harris, and Kevin A. Hassett

NBER Working Paper No. 4685

March 1994

Public Economics

We describe two different accounting regimes that govern reporting practice in most developed countries. "One-book" countries, such as Germany, use their tax books as the basis for financial reporting. "Two-book" countries, including the United States, keep the books largely separate. Firms in one-book countries may be reluctant to claim some tax benefits if reductions in their taxable income can be misinterpreted by financial market participants as signals of lower profitability. Our estimates suggest that differences in accounting regimes play an important role in describing domestic investment patterns, both within and across countries.

Cross-Border Banking

Jonathan Eaton

NBER Working Paper No. 4686

March 1994

JEL No. F23

International Trade and Investment

Some countries export intermediation services to the rest of the world, while many other countries are net exporters of deposits and net importers of loans from banks abroad. Countries that are banking centers typically have lower inflation, deeper financial systems, less government revenue from seigniorage, and lower reserve money relative to bank assets than countries that are not banking centers. This paper develops a model of regulated bank intermediation to examine the role of national monetary poli-

cy in determining the international competitiveness of a national banking system.

Monetary policy involves controlling the supply of reserve money and imposing restrictions on banks that generate a demand for reserve money (reserve requirements). The international competitiveness of a banking system is enhanced by having a monetary authority who places greater weight on the interests of existing creditors relative to debtors in its constituency, and who has less need to raise revenue from seigniorage. With complete integration of deposit and loan markets, the location of intermediation can be indeterminate. Countries that receive more deposits can generate a given amount of seigniorage with less inflation. Monetary authorities in countries that experience deposit outflows may be tempted to impose capital controls in order to maintain their seigniorage base. One implication of this is that integration of monetary policies can facilitate financial integration by reducing the incentive to relocate deposits to avoid the inflation tax.

The Economics of Adjustment

Andrew Caplin and John Leahy

NBER Working Paper No. 4687

March 1994

Economic Fluctuations

We argue that many topics in macroeconomics can be viewed as part of the broader theory of the economics of adjustment. While existing approaches to the economics of adjustment take a very narrow view of the role of information, we outline an approach that stresses the role of learning and information externalities. We then discuss how these concerns alter the qualitative nature of the adjust-

ment process. In particular, there appears to be a general bias toward the underprovision of information in a variety of settings that leads to inefficient adjustment.

Why Do Wage Profiles Slope Upwards? Tests of the General Human Capital Model

David Neumark and Paul J. Taubman

NBER Working Paper No. 4688

March 1994

JEL Nos. J24, J31

Labor Studies

This paper tests some implications of the explanation provided by the general human capital model for rising wage profiles. The model implies that, for individuals, there will be a negative relationship between the initial wage level and wage growth for young, inexperienced workers. At the market level, the present value of the wage profile of an investor equals that of an otherwise identical noninvestor (or, the ratio of the present value equals one)

We find a negative relationship between initial wage levels and wage growth, even after correcting for negative biases that may have influenced existing estimates of this relationship. We also find that the ratio of the present value of rising wage profiles to flat wage profiles is quite close to one. Alternative estimates of this ratio are tightly clustered around one, and more often than not are insignificantly different from one. Overall, then, the evidence is largely consistent with the general human capital model.

Taxes, Leverage, and the National Return on Outbound Foreign Direct Investment

Martin Feldstein

NBER Working Paper No. 4689

March 1994

JEL Nos. H2, H87, F21

Public Economics

The effect of outbound foreign direct investment (FDI) on the national income of the parent firm's country depends on the relative importance of two countervailing factors: the loss of tax revenue to the foreign government, and the increased use of foreign debt. This paper develops an explicit analysis of these two factors in the context of a segmented international capital market, in which most national saving remains in the country in which it is done.

Applying the analysis with realistic values for U.S. outbound FDI, I find that an increase in outbound FDI raises the present value of U.S. national income by a rather substantial amount. Traditional analyses that conclude that the foreign tax credit causes excess outbound FDI fail to take into account the fact that firms that invest abroad increase their use of foreign debt as they increase their FDI.

Why Is There Corporate Taxation in a Small Open Economy? The Role of Transfer Pricing and Income Shifting

Roger H. Gordon and Jeffrey K. MacKie-Mason

NBER Working Paper No. 4690

March 1994

Public Economics

Several recent papers argue that corporate income taxes should not be used by small, open economies. With capital mobility, the burden of

the tax falls on fixed factors (for example, labor), and the tax system would be more efficient if labor were taxed directly. However, corporate taxes not only exist, but have rates roughly comparable with the top personal tax rates.

Past models also forecast that multinationals should not invest in countries with low corporate tax rates, since the surtax they owe when profits are repatriated puts them at a competitive disadvantage. Yet such foreign direct investment is substantial.

We suggest that the resolution of these puzzles may be found in the role of income shifting, both domestic (between the personal and corporate tax bases) and cross border (through transfer pricing). Countries need cash-flow corporate taxes as a backstop to labor taxes to discourage individuals from converting their labor income into otherwise untaxed corporate income. We explore how these taxes can best be modified to deal with cross-border shifting as well.

Outward Direct Investment and the U.S. Economy

Robert E. Lipsey

NBER Working Paper No. 4691

March 1994

JEL Nos. F21, F23

International Trade and Investment

Investment in production outside the United States is a method by which U.S. firms raise their shares in foreign markets and defend them against foreign rivals from the host countries and from other countries. The investing firms are exploiting their firm-specific assets, such as proprietary technologies, patents, or skills in advertising or marketing. The opportunity to produce abroad raises the value of

these assets, and encourages firms' investment in them by extending the range of markets and the length of time over which they can be exploited.

Overseas production has contributed to the ability of American multinationals to retain world market shares in the face of the long-term decline in the share of the United States as a country, and in the face of short-term changes, such as exchange rate fluctuations. It has performed the same functions for Swedish firms and, more recently, for Japanese firms.

Within U.S. multinationals, those with higher shares of production overseas have higher employment at home relative to production at home. Foreign production appears to require larger numbers of employees in headquarters activities, such as R and D and supervision.

Monetary Policy Rules and Financial Stability

Bennett T. McCallum

NBER Working Paper No. 4692

March 1994

JEL Nos. E44, E58

Monetary Economics

This paper empirically investigates the possibility that a central bank could adhere to a macro-oriented monetary policy rule while also providing lender-of-last-resort services to the financial system. The method considered involves smoothing week-to-week movements of an interest rate instrument to achieve quarterly-average intermediate targets for the monetary base, with these targets specified so as to keep aggregate nominal spending growing steadily at a noninflationary rate. I conduct simulations using weekly U.S. data with a system consisting of a policy rule for the federal funds rate—de-

signed to hit monetary base targets obtained from a quarterly macroeconomic rule—and an empirically based model of the response of growth in the base to movements in the funds rate. Results for 1974–9 and 1988–91 suggest that such a procedure could succeed in reconciling macroeconomic goals with the provision of lender-of-last-resort services.

Exchange Rate Dynamics Redux **Maurice Obstfeld and Kenneth Rogoff**

NBER Working Paper No. 4693

March 1994

JEL No. F41

International Finance and Macroeconomics

In this paper, we develop an analytically tractable two-country model that marries a full explanation of exchange rate dynamics to a supply framework based on monopolistic competition and sticky prices. We offer simple and intuitive predictions about exchange rates and current accounts that sometimes differ sharply from those of either modern flexible-price intertemporal models, or traditional sticky-price Keynesian models. We also have a novel perspective on the international welfare spillovers of monetary and fiscal policies.

Can Foreign Aid Accelerate Stabilization? **Alessandra Casella and Barry Eichengreen**

NBER Working Paper No. 4694

March 1994

JEL Nos. E63, F35

International Finance and Macroeconomics

This paper studies the effect of foreign aid on economic stabiliza-

tion. Following Alesina and Drazen (1991), we model the delay in stabilizing as the result of a distributional struggle: reforms are postponed because they are costly, and each distributional faction hopes to reduce its share of the cost by outlasting its opponents in obstructing the required policies. Since the delay is used to signal each faction's strength, the effect of the transfer depends on the role it plays in the release of information. We show that this role depends on the timing of the transfer: foreign aid decided and transferred sufficiently early in the game leads to earlier stabilization; aid decided or transferred too late is destabilizing, and encourages further postponement of reforms.

Issues in the Industrial Organization of the Market for Physician Services

Martin Gaynor

NBER Working Paper No. 4695

March 1994

JEL Nos. L00, I11

Health Care

What is the industrial organization of the market for physician services? I present some background on early studies of this market. I then characterize the nature of the product being bought and sold, and of demand, in order to establish the character of the market. The product being sold is a professional service, and there is a pervasive presence of insurance for consumers. A professional service is inherently heterogeneous, nonretradable, and subject to an asymmetry of information between buyers and sellers. These characteristics are what bestow market power on sellers, further strengthened by the fact that consumers face only a small fraction of the price of any service, because of in-

surance. I then discuss the implications of this for agency relationships between patients and physicians, and insurers (both private and public) and physicians. I also consider agency relationships within physician firms. I recommend both theoretical and empirical modeling of contracting between insurers and physicians, and of the joint agency problems between patient and physician and insurer and physician, as areas for future research. Since failures in this market derive largely from the structure of information, the potential gains from government intervention may be circumscribed sharply.

Measuring Industry-Specific Protection: Antidumping in the United States

Robert W. Staiger and Frank A. Wolak

NBER Working Paper No. 4696

March 1994

JEL No. F13

International Trade and Investment

This paper provides estimates of the trade impacts of U.S. antidumping law and the determinants of filing lawsuits from 1980–5. We study three possible channels through which the threat or mere possibility of antidumping duties can restrict trade; we believe that, when combined with the direct effects of duties, these capture most of the trade effects of antidumping law. We refer to these three nonduty effects as the *investigation effect*, the *suspension effect*, and the *withdrawal effect*. Investigation effects occur when an antidumping investigation takes place; suspension effects occur under so-called "suspension agreements"; and withdrawal effects occur after a petition is simply withdrawn without a final determination. We find substantial

trade restrictions associated with the first two effects, but not with the third. Finally, we find evidence suggesting that some firms initiate antidumping procedures for the trade-restricting investigation effects alone.

Macroeconomic Stabilization in Latin America: Recent Experience and Some Sequencing Issues

Sebastian Edwards

NBER Working Paper No. 4697

April 1994

International Trade and Investment,
International Finance and
Macroeconomics

This paper reviews the experience of Latin American countries with structural reforms, and discusses the relationship between macroeconomic stabilization and trade liberalization programs undertaken in the region since the early 1980s. I analyze in detail the problem of sequencing of stabilization and structural reforms. I particularly emphasize the fiscal consequences of the chosen sequencing, as well as its impact on the evolution of domestic savings and investment, and on foreign investment. The final part of the paper concentrates on the behavior of real exchange rates during the stabilization programs and its relationship with trade reforms.

Shocks

John H. Cochrane

NBER Working Paper No. 4698

April 1994

Economic Fluctuations

What are the shocks that drive economic fluctuations? I examine technology and money shocks in some detail, and briefly review the evidence on oil price and credit

shocks. I conclude that none of these popular candidates accounts for the bulk of economic fluctuations. I then examine whether "consumption shocks," news that agents see but we do not, can account for fluctuations. I find that it may be possible to construct models with this feature, although it is more difficult than is commonly realized. If this view is correct, we will remain forever ignorant of the fundamental causes of economic fluctuations.

The Effects of Monetary Policy Shocks: Some Evidence from the Flow of Funds

**Lawrence J. Christiano,
Martin Eichenbaum, and
Charles L. Evans**

NBER Working Paper No. 4699

April 1994

JEL No. E32

Monetary Economics,
Economic Fluctuations

This paper uses the Flow of Funds accounts to assess the impact of a monetary policy shock on the borrowing and lending activities of different sectors of the economy. Our measures of contractionary monetary policy shocks have the following properties: 1) they are associated with a fall in nonborrowed reserves, total reserves, M1, the Federal Reserve's holdings of government securities, and a rise in the federal funds rate; 2) they lead to persistent declines in real GNP, employment, retail sales, and nonfinancial corporate profits, as well as to increases in unemployment and manufacturing inventories; 3) they generate sharp, persistent declines in commodity prices; and 4) the GDP price deflator does not respond to them for roughly a year; after that, the GDP price deflator declines.

Our major findings regarding the borrowing activities of different sectors can be summarized as follows: first, following a contractionary shock to monetary policy, net funds raised by the business sector increases for roughly a year. Thereafter, as the recession induced by the policy shock gains momentum, net funds raised by the business sector begins to fall. This pattern is not captured by existing monetary business cycle models. Second, we cannot reject the view that households do not adjust their financial assets and liabilities for several quarters after a monetary shock. This is consistent with a key assumption of several recent monetary business cycle models.

Information and the Demand for Supplemental Medicare Insurance

**Paul J. Gertler, Roland Sturm,
and Bruce Davidson**

NBER Working Paper No. 4700

April 1994

JEL Nos. D8, I1

Health Care

While the critical role of imperfect information has become axiomatic in explaining the failure of the health care market, the theory is backed by little empirical evidence. In this paper, we use a unique panel dataset with explicit measures of information and an educational intervention to investigate the role of imperfect information about health insurance benefits on the demand for supplemental Medicare insurance. We allow imperfect information to affect both the mean and the variance of the expected benefits distribution.

We find that imperfect information affects the demand for supplemental Medicare insurance by increasing the variance of the expected

benefits distribution, rather than by systematically shifting the mean of the distribution. We find that the increase in variance caused by imperfect information increases the probability of choosing *not* to purchase supplemental insurance by about 23 percent.

How Much Did Capital Forbearance Add to the Tab for the FSLIC Mess?

Edward J. Kane and Min-Teh Yu

NBER Working Paper No. 4701

April 1994

JEL Nos. G2, K2, L5

Corporate Finance

Federal regulators characterize capital forbearance as an efficient way of nursing weak banks and thrifts back to health. An alternative hypothesis is that forbearance reflects inefficient costs of agency that fall on federal deposit insurance funds. This paper seeks to measure the opportunity cost of FSLIC forbearance during 1985-9. Although the opportunity cost of delay did not increase every year, it did increase on average. Had opportunity-cost standards of capital adequacy been enforced routinely, FSLIC guarantees would not have displaced private capital on a mammoth scale, surviving members of the industry would have proven more profitable, and investments in commercial real estate would have been restrained.

Portfolio Inefficiency and the Cross-Section of Expected Returns

**Shmuel Kandel and
Robert F. Stambaugh**

NBER Working Paper No. 4702

April 1994

JEL No. G12

Asset Pricing

A plot of expected returns versus betas bears virtually no rela-

tionship to the mean-variance location of an inefficient index portfolio. If the index portfolio is inefficient, then the coefficients and R-squares from an ordinary-least-squares regression of expected returns on betas can equal essentially any desired values. The mean-variance location of the index does determine the properties of a cross-sectional mean-beta relationship fitted by generalized least squares (GLS). As the index portfolio moves closer to complete efficiency, the GLS mean-beta relationship moves closer to the exact linear relationship that corresponds to an efficient portfolio with the same variance. The goodness-of-fit for the GLS regression is the index portfolio's squared relative efficiency, which measures closeness to efficiency in mean-variance space.

The Tax Sensitivity of Foreign Direct Investment: Evidence from Firm-Level Panel Data

**Jason G. Cummins and
R. Glenn Hubbard**

NBER Working Paper No. 4703

April 1994

JEL Nos. H25, F21

Public Economics

Understanding the determinants of foreign direct investment (FDI) is important for analyzing capital flows and the industrial organization of multinational firms. However, most empirical studies of FDI have focused on nontax factors in overseas investment decisions, or on reduced-form relationships between some measure of FDI and the investment decision. In this paper, we use previously unexplored (for this purpose) panel data on FDI by subsidiaries of U.S. multinational firms. These firm-level data contain information on new capital investment overseas that enables

us to measure more precisely tax influences on FDI, and allow us to focus on structural models of subsidiaries' investment decisions. Our empirical results cast significant doubt on the simplest notion that "taxes don't matter" for U.S. firms' FDI decisions. Taxes appear to influence FDI in precisely the ways indicated by neoclassical models. Our results also support the application of the "tax capitalization" model to the study of dividend repatriation and FDI decisions.

Executive Pay and Performance: Evidence from the U.S.

**Banking Industry
R. Glenn Hubbard and
Darius Palia**

NBER Working Paper No. 4704

April 1994

JEL No. G32

Corporate Finance,
Monetary Economics

Given that each state's banking regulation defines the competitiveness of its corporate control market, we examine the effect of a state's interstate banking regulation on the level and structure of bank CEO compensation. Using panel data on 147 banks for the 1980s, we find that competitive corporate control markets (that is, markets in which interstate banking is permitted) require talented managers whose levels of compensation are higher. We also find that the relationship between compensation and performance is stronger in such markets than for managers in markets in which interstate banking is not permitted. Further, CEO turnover increases substantially after deregulation, as does the proportion of performance-related compensation. Thus there is strong evidence of a managerial talent market—that is, one that matches the

level and structure of compensation with the competitiveness of the banking environment.

Recent Developments in the Marriage Tax

**Daniel R. Feenberg and
Harvey S. Rosen**

NBER Working Paper No. 4705

April 1994

JEL No. H24

Public Economics

The new tax law increases tax rates for high-income individuals, and expands the earned income tax credit for low-income individuals. We use a sample of actual tax returns to compute estimates of the "marriage tax"—the change in couples' joint tax upon marriage—under this new law. We predict that in 1994, 52 percent of American couples will pay a marriage tax, with an average of about \$1244; 38 percent will receive a subsidy averaging about \$1399. These aggregate figures mask a considerable amount of dispersion in the population. Under the new law, the marriage tax for certain low-income families can exceed \$3000 annually; for certain very high-income families, it can exceed \$10,000 annually.

A Semi-Classical Model of Price Level Adjustment

Bennett T. McCallum

NBER Working Paper No. 4706

April 1994

JEL Nos. E13, E32

Economic Fluctuations,
Monetary Economics

This paper investigates the theoretical and empirical properties of a model of aggregate supply behavior that was introduced in the 1970s but has received inadequate attention. The model postulates that price changes occur so as to

gradually eliminate discrepancies between actual and market-clearing values and to reflect expected changes in market-clearing values. The model's implications are more "classical" than most alternative formulations that reflect gradual price adjustment. Empirical results, using a proxy for market-clearing output that is a function of fixed capital and the real price of oil, are moderately encouraging but not entirely supportive.

The U-Shaped Female Labor Force Function in Economic Development and Economic History **Claudia Goldin**

NBER Working Paper No. 4707
April 1994
JEL Nos. J21, N30, J22
Development of the
American Economy

The labor force participation rate of married women first declines and then rises as countries develop. Its U-shape is revealed both across the process of economic development and through the histories of currently advanced economies. The initial decline in the participation rate is caused by the movement of production from the household, family farm, and small business to the wider market, and by a strong income effect. But the income effect weakens and the substitution effect strengthens at some point. This paper explores why the change takes place and why the U-shape is traced out. When women are poorly educated, their only wage labor outside the home and family farm is in manual work, against which a strong social stigma exists. But when women are educated, particularly at the secondary level, they enter white-collar work, against which no social stigma exists. This paper uses data

for more than 100 countries and the United States to explore the hypothesis of the U-shaped female labor force function.

Alcohol Advertising and Motor Vehicle Fatalities **Henry Saffer**

NBER Working Paper No. 4708
April 1994
JEL Nos. I1, M3
Health Economics

This paper empirically estimates the effect of alcohol advertising on motor vehicle fatalities. I develop the concept of an industry-level advertising response function and review other empirical issues in estimating the effects of advertising. The dataset consists of 1200 quarterly observations, from 1986 to 1989, for 75 advertising markets in the United States.

I find that alcohol advertising has a significant and positive effect on motor vehicle fatalities. Even if a ban on broadcast advertising of alcohol did not also include bans on other types of alcohol marketing, the effect on motor vehicle fatalities might be in the range of 2000 to 3000 lives saved per year. Elimination of the tax deductibility of alcohol advertising could reduce it by about 27 percent, reduce motor vehicle fatalities by about 2300 deaths per year, and raise about \$336 million a year in new tax revenue.

The U.S. Fiscal Problem: Where We Are, How We Got There, and Where We're Going **Alan J. Auerbach**

NBER Working Paper No. 4709
April 1994
JEL Nos. E65, H62
Economic Fluctuations,
Public Economics

This paper deals with several issues regarding the causes and implications of recent and projected U.S. federal budget deficits. It considers why deficits have remained so large in spite of deficit reduction efforts, evaluates the impact of the recent policies of the Clinton administration, and offers long-range deficit projections. Among the paper's findings are:

1. Until last year, the deficit projections of the past decade consistently have been too optimistic. Had initial projections for the current fiscal year proved accurate, the deficit-reducing policies of the early 1990s already would have driven the federal budget well into surplus. There is no single explanation for these large and systematic forecasting errors.

2. The budget rules that legislators have developed to control deficits, including those now in effect, are ill-designed: they fail to compensate for forecasting errors, and encourage shifts in the timing of revenues and expenditures. I show that such shifting has followed the incentives of the different schemes.

3. The projected decline in the deficit as a share of GDP over the next few years reflects not only the policies already enacted but also the continuation of significant real reductions in discretionary spending, representing a drop of 2.2 percent of GDP between 1994 and 2004.

4. Even if such optimistic forecasts prove to be correct, longer-run projections suggest that current fiscal policy is unsustainable. Without any growth in the relative price of health care, the demographic transition still is projected to lead to sharp increases in Social Security and Medicare benefits as a share of GDP, and primary deficits of nearly 4 percent of GDP.

U.S. Foreign Trade and the Balance of Payments, 1800–1913

Robert E. Lipsey

NBER Working Paper No. 4710

April 1994

JEL Nos. F14, F2, N71

Development of the American Economy,
International Trade and Investment

This paper reviews the main developments in U.S. trade and the balance of payments from the first years of the nineteenth century to the first decade of the twentieth. American export trade was dominated by agricultural and other resource products long after the majority of the labor force had shifted out of agriculture. The shift out of agriculture was more rapid among the major trading partners of the United States, because the American land area increased in the first half of the nineteenth century, and agricultural land increased throughout the century. The rise in agricultural land area and a rapid decline in transport cost increased the supply of U.S. agricultural products to Europe, and further displaced European agriculture and encouraged migration from Europe. The existence of the large world market, relatively open to the products of American comparative advantage and with a high price elasticity of demand for American exports, encouraged the expansion of U.S. land, agriculture, capital inflows, immigration, and the western migration of population.

Convergence in the Age of Mass Migration

**Jeffrey G. Williamson
and Alan M. Taylor**

NBER Working Paper No. 4711

April 1994

JEL Nos. F2, N1, O4

Development of the American Economy
Between 1870 and 1913, eco-

nomie convergence among present OECD members (or even a wider sample of countries) was dramatic, about as dramatic as it has been over the past century and a half. The convergence can be documented in GDP per worker-hour, GDP per capita, and in real wages. What were its sources? One prime candidate is mass migration. In the absence of quotas, this was a period of open international migration, and the numbers electing to move were enormous. If international migration is ever to play a role in contributing to convergence, the prequota period surely should be the time. This paper offers some estimates that suggest that migration could account for very large shares of the convergence in GDP per worker and real wages, although a much smaller share in GDP per capita. Therefore, the interwar cessation of convergence could be explained partially by the imposition of quotas and other barriers to migration. However, this paper enumerates the possible offsets to the mass migration impact that this partial equilibrium analysis ignores, and that suggests that convergence models pay more attention to open-economy forces.

U.S. Interest Allocation Rules: Effects and Policy

**Rosanne Altshuler
and Jack Mintz**

NBER Working Paper No. 4712

April 1994

JEL Nos. H25, H32, H87

International Trade and Investment,
Public Economics

For U.S. multinationals, one of the important changes of the 1986 tax reform is related to the allocation of interest expense. Prior to 1986, U.S. companies allocated domestic interest expense to the income of foreign affiliates on a non-

consolidated basis, according to the distribution of gross income or assets. After 1986, a U.S. multinational is required to allocate domestic interest expense on a consolidated basis, according to the distribution of U.S. and foreign assets.

We analyze the impact of the new interest allocation rules on the financial and investment decisions of U.S. multinationals using data from a survey of multinationals assembled by Price Waterhouse. We find that the new allocation of interest expense increases the marginal cost of U.S. debt by about 38 percent for firms with excess foreign tax credits. Our empirical tests suggest that firms have altered the location of their borrowings in response to the new rules. We also find that the requirement to allocate interest expense has a significant impact on the effective tax rate faced by U.S. multinationals. For U.S. domestic investments, the interest allocation rules increase the U.S. effective rate from 17.6 percent to 21.9 percent. The rules also increase the effective tax rates on foreign investments made by U.S. firms.

Regional Adjustment to Trade Liberalization

Gordon H. Hanson

NBER Working Paper No. 4713

April 1994

JEL Nos. F14, O18, R11

International Trade and Investment

I study the effect of economic integration with the United States on state-industry employment growth in Mexico. I disentangle the effects of two opposing forces on regional labor demand: transport-cost considerations, which, all else equal, encourage firms to relocate their activities to regions with relatively good access to foreign markets; and agglomeration econo-

mies, which, all else equal, reinforce the pretrade pattern of industry location. I find that trade liberalization has strong effects on industry location. Consistent with the transport-costs hypothesis, post-trade employment growth is higher in state industries that are relatively close to the United States. The results on agglomeration effects are mixed. Employment growth is higher where agglomeration in upstream and downstream industries is higher, but not where the agglomeration of firms in the same industry is higher. The results suggest that trade liberalization has contributed to the decomposition of the manufacturing belt in and around Mexico City, and to the formation of broadly specialized industry centers located in northern Mexico, relatively close to the United States. The North American Free Trade Agreement is likely to reinforce these movements.

Evidence on Growth, Increasing Returns, and the Extent of the Market

Alberto F. Ades and Edward L. Glaeser

NBER Working Paper No. 4714

April 1994

JEL Nos. F43, O40

Growth

We examine two sets of economies (nineteenth-century U.S. states, and twentieth-century less-developed countries) where growth rates are correlated positively with initial levels of development in order to document how these dynamic increasing returns operate. We find that open economies do not display a positive connection between initial levels and later growth; instead, closed economies display this positive correlation (that is, divergence). This suggests that increasing returns operate by

expanding the extent of the market (as in the big push theories of Murphy, Shleifer, and Vishny [1989]). We also find that for U.S. states, larger markets enhance growth by increasing the division of labor. Among LDCs, while more diversified production increases growth, diversification is associated negatively with openness for the poorest economies (as in the quality ladder theories of Boldrin and Scheinkman [1988], Young [1991], and Stokey [1991]). However, and despite the negative effect that openness has on the diversity of production and, thus, on growth, we find that openness still substantially increases growth for these poorer economies.

Trade and Circuses: Explaining Urban Giants

Alberto F. Ades and Edward L. Glaeser

NBER Working Paper No. 4715

April 1994

JEL Nos. O40, R10

Growth

Using theory, case studies, and cross-country evidence, we investigate the factors behind the concentration of a nation's urban population in a single city. High tariffs, high costs of internal trade, and low levels of international trade increase the degree of concentration. Even more clearly, politics (such as the degree of instability) determines urban primacy. Dictatorships have central cities that are, on average, 50 percent larger than their democratic counterparts. Using information about the timing of city growth, and considering other factors, we conclude that the predominant causality is from political factors to urban concentration, not from concentration to political change.

Trade, Wages, and Revolving Door Ideas

Edward E. Leamer

NBER Working Paper No. 4716

April 1994

International Trade and Investment, Labor Studies

This paper gives examples of the misuse of the international microtheory linking technological change and globalization to the internal (U.S.) labor market. This international microtheory serves as a foundation for a reexamination of the NBER Trade and Immigration Data Base, which describes output, employment, and investment in 450 U.S. 4-digit-SIC manufacturing sectors beginning in 1970. Estimates of the impact of technological change on income inequality vary widely, depending on the form of the model and the choice of data subsets, but the estimates uniformly suggest that technological change reduced income inequality, not increased it. The data separation into "production" and "nonproduction" workers has little association with skill levels, and these data probably cannot be used to study income inequality.

A Stock Index Mutual Fund Without Net Capital Gains Realizations

Joel M. Dickson and John B. Shoven

NBER Working Paper No. 4717

April 1994

JEL No. G31

Public Economics

We reconsider the literature on tax options by examining the ability to defer net realizations of capital gains within an equity portfolio whose constituents change over time. Unlike previous studies on the value of tax options, this paper examines aftertax returns to share-

holders within an equity mutual fund. The mutual fund context allows certain features of the states' tax laws—namely, wash-sale rules, and the offsetting of short-term and long-term capital gains and losses—to be incorporated in assessing the potential improvement in post-tax returns to investors engaging in tax minimization strategies.

Specifically, we investigate the feasibility of managing open-end and closed-end Standard & Poor's 500 index funds that defer net realizations of capital gains. A combination of FIFO (highest in, first out) accounting procedures, and the systematic booking of significant losses in portfolio constituents, would have allowed the open-end fund variant to match the annual pretax return of Vanguard's Index 500 Fund, while improving annual aftertax performance by as much as 97 basis points through the elimination of all capital gains realizations between 1977 and 1991. Deferring capital gains is easier for open-end funds relative to closed-end funds, while the additional turnover required to implement these strategies is quite modest. We name the tax-sensitive funds in this paper "SURGE (Strategies Using Realized Gains Elimination) funds."

A Nonparametric Approach to Pricing and Hedging Derivative Securities Via Learning Networks

James M. Hutchinson, Andrew W. Lo, and Tomaso Poggio

NBER Working Paper No. 4718

April 1994

JEL No. G13

Asset Pricing

We propose a nonparametric method for estimating the pricing formula of a derivative asset using learning networks. Although not a

substitute for the more traditional arbitrage-based pricing formulas, network pricing formulas may be more accurate and computationally more efficient alternatives if the underlying asset's price dynamics are unknown, or when the pricing equation associated with no-arbitrage condition cannot be solved analytically. To assess the potential value of network pricing formulas, we simulate Black-Scholes option prices. We show that learning networks can recover the Black-Scholes formula from a two-year training set of daily options prices, and that the resulting network formula can be used successfully to both price and delta-hedge options out-of-sample. For comparison, we estimate models using four popular methods: ordinary least squares; radial basis function networks; multi-layer perceptron networks; and projection pursuit. To illustrate the practical relevance of our network pricing approach, we apply it to the pricing and delta-hedging of S&P 500 futures options from 1987 to 1991.

Reconsidering the Costs of Business Cycles with Incomplete Markets

Andrew Atkeson and Christopher Phelan

NBER Working Paper No. 4719

April 1994

JEL Nos. E60, E32, E24

Economic Fluctuations

We measure the potential welfare gains from countercyclical policy in an economy with incomplete markets. In particular, we focus on two questions central to the determination of those potential gains: 1) what is the likely effect of countercyclical policy on the nature of the income risk faced by individuals in the economy, and 2) what are the likely general equilibrium

effects brought about as asset prices change in reaction to the implementation of countercyclical policies? We see the first question as critical to distinguishing whether the main effect of countercyclical policy is to reduce the income risk faced by each individual directly, or simply to reduce the correlation across individuals in the income risk that they face. We argue that the main effect of countercyclical policy aimed at reducing aggregate fluctuations may be simply to remove the correlation across individuals in the unemployment risk that they face. We then use asset price data to argue that in an incomplete markets framework, the potential welfare gains from countercyclical policy are close to zero.

Implementing Option Pricing Models When Asset Returns Are Predictable

Andrew W. Lo and Jiang Wang

NBER Working Paper No. 4720

April 1994

JEL No. G13

Asset Pricing

Option pricing formulas obtained from continuous-time no-arbitrage arguments, such as the Black-Scholes formula, generally do not depend on the drift term of the underlying asset's diffusion equation. However, the drift is essential for properly implementing such formulas empirically, since the numerical values of the parameters that do appear in the option pricing formula can depend intimately on the drift. In particular, if the underlying asset's returns are predictable, this will influence the theoretical value and the empirical estimate of the diffusion coefficient. We develop an adjustment to the Black-Scholes formula that ac-

counts for predictability, and show that this adjustment can be important even for small levels of predictability, especially for longer-maturity options. We propose a class of continuous-time linear diffusion processes for asset prices that can capture a wider variety of predictability, and provide several numerical examples that illustrate their importance for pricing options and other derivative assets.

Congressional Distributive Politics and State Economic Performance

**James M. Poterba and
Steven D. Levitt**

NBER Working Paper No. 4721

April 1994

JEL Nos. D72, H23

Public Economics

This paper tests several theories of the effects of congressional representation on state economic growth. States that were represented by very senior Democratic congressmen grew more quickly during 1953–90 than states that were represented by more junior congressional delegations. We find some, but weaker, evidence that states with a high fraction of their delegation on particularly influential committees also exhibit above-average growth. We also test partisan models of distributive politics by studying the relationship between a state's degree of political competition and its growth rate. Our findings support both nonpartisan and partisan models of congressional distributive politics. In spite of our findings with respect to economic growth, we cannot detect any substantively important association between congressional delegation seniority, the degree of state political competition, and the geographic distribution of federal funds. Therefore, the source of the

growth relationships we identify remains an open question.

Testing Static Trade-Off Against Pecking-Order Models of Capital Structure

**Lakshmi Shyam-Sunder and
Stewart C. Myers**

NBER Working Paper No. 4722

April 1994

JEL No. G32

Corporate Finance

This paper tests traditional capital structure models against the alternative of a pecking-order model of corporate financing. The basic pecking-order model, which predicts external *debt* financing driven by the internal financial deficit, has much greater explanatory power than a static trade-off model, which predicts that each firm adjusts toward an optimal debt ratio. We show that the power of some usual tests of the trade-off model is virtually nil. We question whether the available empirical evidence supports the notion of an optimal debt ratio.

Firm Diversification and CEO Compensation: Managerial Ability or Executive Entrenchment?

**Nancy L. Rose and
Andrea Shepard**

NBER Working Paper No. 4723

April 1994

JEL Nos. L2, G3, J33, J41

Industrial Organization

Data for a sample of 558 CEOs over 1985–90 suggest substantial compensation premiums for managers of diversified firms. The CEO of a firm with two distinct lines of business averages 10 to 12 percent more in salary and bonus, and 13 to 17 percent more in total compensation, than the CEO of a similar-sized but undiversified firm, all

else equal. This corresponds to average 1990 salary gains of \$115,000 to \$145,000 per year for our sample. Diversification may raise pay because the CEO's job requires higher ability, or because it is associated with CEO entrenchment. If ability explains the correlation, we would expect the diversification premium not to vary with tenure. Entrenchment models suggest higher premiums for more experienced (more entrenched) CEOs, and an increase in compensation when the CEO diversifies the firm. The data support an ability model over an entrenchment explanation. The diversification premium is not affected by tenure, and increasing diversification reduces compensation for incumbent CEOs, all else equal.

The Valuation of Cash Flow Forecasts: An Empirical Analysis

**Steven N. Kaplan and
Richard S. Ruback**

NBER Working Paper No. 4724

April 1994

Corporate Finance

This paper compares the market value of highly leveraged transactions (HLTs) to the discounted value of their corresponding cash flow forecasts. These forecasts are provided by management to investors and shareholders in 51 HLTs completed between 1983 and 1989. Our estimates of discounted cash flows are within 10 percent, on average, of the market values of the completed transactions. Our estimates perform at least as well as valuation methods using comparable companies and transactions. We also invert our analysis, and estimate the risk premium implied by transaction values and forecast cash flows, and the relationship of the implied risk premium to firm-level

betas, industry-level betas, firm size, and firm book-to-market ratios.

Capital Goods Imports and Long-Run Growth

Jong-Wha Lee

NBER Working Paper No. 4725

April 1994

JEL Nos. F43, O40

Growth,

International Trade and Investment

This paper presents a model of an open economy in which the growth rate of income is higher if foreign capital goods are used relatively more than domestic capital goods in the production of capital stock. Using cross-country data for 1960–85, I find that the ratio of imported to domestically produced capital goods in the composition of investment has a significant, positive effect on growth rates of per capita income across countries, in particular in developing countries. Hence, the composition of investment, in addition to the volume of total capital accumulation, is an important determinant of economic growth.

A Comparison of Job Creation and Job Destruction in Canada and the United States

John Baldwin, Timothy Dunne, and John C. Haltiwanger

NBER Working Paper No. 4726

May 1994

JEL Nos. C81, E24, J21, J63

Economic Fluctuations

In recent years, a growing number of countries have constructed data series on job creation and job destruction using establishment-level datasets. This paper describes and compares these new series for the United States and Canada. Industry-level job creation and destruction rates are remarkably simi-

lar in Canada and the United States. Industries with high (low) job creation in the United States exhibit high (low) job creation in Canada. The same is true for job destruction. In addition, the overall magnitude of gross job flows in the two countries is comparable.

Second, the time-series patterns of creation and destruction are qualitatively similar, but differ in a number of important respects. In both countries, job destruction is much more volatile cyclically than job creation. However, this cyclical asymmetry is more pronounced in the United States.

Transaction Costs in Dealer Markets: Evidence from the London Stock Exchange

Peter C. Reiss and Ingrid M. Werner

NBER Working Paper No. 4727

May 1994

JEL Nos. C81, F21, D4, L00

Asset Pricing, Industrial Organization

This paper describes regularities in the intraday spreads and prices quoted by dealers on the London Stock Exchange. We develop a measure of spread-related transaction costs that recognizes dealers' willingness to price trades within their quoted spreads. This measure shows that trading costs are related systematically to a trade's size, the characteristics of the trading counterparties, and the characteristics of the security. Customers pay the full spread on small trades, while medium to large trades receive more favorable execution. Marketmakers only discount trades of very large customers, while dealers regularly discount medium to large trades. Interdealer trades generally receive favorable execution, and discounts increase in size. Marketmakers do not discount trades with each other

over the phone, but do discount when trading anonymously using interdealer brokers. Quoted and touch spreads fall with the number of marketmakers; the rate of decline reflects economies of scale in marketmaking.

Cities and Skills

Edward L. Glaeser and David C. Maré

NBER Working Paper No. 4728

May 1994

JEL Nos. R10, J31

Growth, Labor Studies

This paper examines the productivity (and wage) gains from locating in dense, urban environments. We distinguish among three potential explanations of why firms are willing to pay urban workers more: 1) the urban wage premium is spurious, and is the result of omitted ability measures; 2) the urban wage premium works because cities enhance productivity; and 3) the urban wage premium is the result of faster skill accumulation in cities. Using a combination of standard regressions, individual fixed-effects estimation (using migrants), and instrumental variables methods, we find that the first and second explanations are not sufficient. The bulk of the urban wage premium accrues over time as a result of greater skill accumulation in cities.

Training and the Growth of Wage Inequality

Jill M. Constantine and David Neumark

NBER Working Paper No. 4729

May 1994

JEL Nos. J24, J31

Labor Studies

Shifts in the incidence of various types of training during the 1980s favored more educated, more experienced workers. Coupled with

the fact that this training is associated with higher wages, these shifts suggest that training may have contributed to the growth of wage inequality in this period. However, the shifts were apparently too small, or the returns to training too low, for training to have played a substantial role in this increase in inequality. The estimated changes in wage differentials associated with schooling and experience are, at best, only slightly smaller once we account for changes in the distribution of training across schooling and experience groups, changes in the returns to training, and changes in the length of training programs.

Externalities and Industrial Development **Vernon Henderson**

NBER Working Paper No. 4730
May 1994
Miscellaneous

Using a panel dataset on county-level employment in machinery, electrical machinery, primary metals, transportation, and instruments, I analyze the role of dynamic externalities for individual industries. I compare the role of externalities from own-industry concentration with the role of externalities from overall diversity of the local environment. In contrast to previous studies, the use of panel data here allows me to separate these effects out from fixed/random effects influencing industries over time.

The panel data also allow me to estimate how long history matters, and the time pattern of effects. In particular, do conditions from the immediate year or so prior to the current year have the biggest impact on current employment, or do periods several years earlier have the largest impact?

For all industries, both localiza-

tion and urbanization effects are important. For traditional industries, most effects die out after four or five years, but for high tech industries, effects can persist longer. The biggest effects are typically from conditions of three to four years ago, in the county and metropolitan area.

An Analysis of Fee-Shifting Based on the Margin of Victory: On Frivolous Suits, Meritorious Suits, and the Role of Rule 11 **Lucian Arye Bebchuk and Howard F. Chang**

NBER Working Paper No. 4731
May 1994
Law and Economics

We show that, when plaintiffs cannot predict the outcome of litigation with certainty, neither the American rule of litigation cost allocation (under which each litigant bears its own expenses) nor the British rule (under which the losing litigant pays the attorneys' fees of the winning litigant) would induce plaintiffs to make optimal decisions to bring suit. In particular, plaintiffs may bring frivolous suits when litigation costs are sufficiently small relative to the amount at stake, and plaintiffs may not bring some meritorious suits when litigation costs are sufficiently large relative to the amount at stake.

We analyze the effect of more general fee-shifting rules that are based not only upon the identity of the winning party but also on how strong the court perceives the case to be at the end of the trial: that is, the "margin of victory." In particular, we explore how and when one can design such a rule to induce plaintiffs to sue if and only if they believe their cases are sufficiently strong. Our analysis suggests some considerations to guide the inter-

pretation of Federal Rule of Civil Procedure 11.

Trade Unions and the Dispersion of Earnings in British Establishments, 1980-90

Amanda Gosling and Stephen Machin

NBER Working Paper No. 4732
May 1994
Labor Studies

We examine the relationship between unions and earnings dispersion using establishment-level data from the 1980, 1984, and 1990 Workplace Industrial Relations Surveys. Initially, we use the 1990 data. The earnings dispersion of skilled and semiskilled workers is lower across unionized establishments than across nonunion establishments. Second, within-establishment earnings dispersion is lower in plants that recognize trade unions for collective bargaining purposes than in those that do not.

We then use the three surveys to ascertain to what extent the decline in unionization in Britain has contributed to the rise in earnings inequality of semiskilled workers. There was a sizable and important widening of the gap in the dispersion of earnings across union and nonunion plants between 1980 and 1990. For semiskilled earnings, the decline in the share of plants with recognized unions can account for 11-17 percent of the rise in earnings inequality over this time period. The importance of falling union activity (as measured by union recognition) seemed to accelerate through the 1980s. Between 1980 and 1984, the relatively small falls in aggregate recognition explain less than 10 percent of the inequality increase, whereas between 1984 and 1990, about one-quarter of the increase can be accounted for by

the fall in unionization. However, the majority of the rise in earnings inequality is the result of a large increase in earnings dispersion across nonunion establishments.

**British Unions in Decline:
An Examination of the
1980s Fall in Trade
Union Recognition**

**Richard Disney, Amanda
Gosling, and Stephen Machin**

NBER Working Paper No. 4733

May 1994

JEL No. J5

Labor Studies

We analyze establishment-level data from the three Workplace Industrial Relations Surveys of 1980, 1984, and 1990 to document and explain the sharp decline in unionization that occurred in Britain over the 1980s. Between 1980 and 1990, the proportion of British establishments that recognized manual or nonmanual trade unions for collective bargaining over pay and conditions fell by almost 20 percent (from 0.67 to 0.54). The evidence reported demonstrates the importance of the interaction among the labor market, the product market, employer behavior, and the legislative framework in determining union recognition status in new establishments. The sharp fall in trade union recognition appears to be driven largely by a failure to achieve recognition status in establishments set up in the 1980s. These results, when taken in conjunction with recent changes in the nature of employment in the British labor market, seem to paint a bleak picture for unions. There appears to be no reason why the decline in union activity should not continue into the 1990s.

**The Distribution of Public
Sector Wage Premiums:
New Evidence Using
Quantile Regression
Methods**

**James M. Poterba and
Kim S. Rueben**

NBER Working Paper No. 4734

May 1994

JEL Nos. H72, J45

Public Economics

This paper documents the changing pattern of wage differentials between state and local government employees and their private sector counterparts during 1979–92. While the relative wages of women employed in the two sectors changed very little during this period, the relative wages of men employed in the state and local sector rose nearly 8 percent. There is substantial heterogeneity in the changes in relative wages of public and private sector employees during the 1980s. For highly educated workers, private sector wages rose significantly faster than public sector wages. For those with at most a high school education, the public sector wage premium increased. We present both least squares and quantile regression estimates of the public sector premium. While the level of this premium is sensitive to our choice of quantile, the change in the premium, and the estimated pattern across skill levels, is not affected substantially by varying the quantile.

**The Soviet Economic
Decline: Historical
and Republican Data**

**William Easterly and
Stanley Fischer**

NBER Working Paper No. 4735

May 1994

JEL No. O40

Economic Fluctuations

Soviet growth over 1960–89 was

the worst in the world after controlling for investment and human capital; the relative performance of Soviet growth worsens over time. The declining Soviet growth rate from 1950–87 is explained by the declining marginal product of capital; the rate of total factor productivity growth is roughly constant over that period. While the Soviet slowdown conventionally has been attributed to extensive growth (rising capital-to-output ratios), extensive growth also is a feature of market-oriented economies, such as Japan and Korea. What led to the relative Soviet decline was a low elasticity of substitution between capital and labor, which caused diminishing returns to capital to be especially acute. Tentative evidence indicates that the burden of defense spending also contributed to the Soviet debacle. Differences in growth performance among the Soviet republics are explained well by some of the same factors that figure in the empirical cross-section growth literature: initial income; human capital; population growth; and the degree of sectoral distortions.

**On the Speed of Transition
in Central Europe**

**Philippe Aghion and
Olivier Jean Blanchard**

NBER Working Paper No. 4736

May 1994

JEL Nos. E1, O1, P2, P3

Economic Fluctuations

Transition in Central Europe is four years old. State firms that dominated the economy are struggling with market forces. A new private sector emerged quickly and has taken hold. Unemployment, which did not exist, is high and still increasing. Will this process of transition accelerate, or slow down? Will unemployment keep increasing? Can things go wrong, and how?

Our paper represents a first pass at answering those questions. The basic structure of the model we develop is standard, describing transition from a low to a high productivity sector. But we pay attention to two aspects that strike us as important: first, the interactions between unemployment and the decisions of both state and private firms; second, idiosyncracies stemming from the central planning legacy, including the structure of control within state firms and the lack of market institutions, which limits the growth of the private sector.

We start with a description of transition in Poland. We then develop a model and use it to think about the determinants of the speed of transition and the level of unemployment. Finally, we return to the role of policy and the future in Poland, as well as to the causes of cross-Central European country variations.

Anticipations of Foreign Exchange Volatility and Bid-Ask Spreads

Shang-Jin Wei

NBER Working Paper No. 4737

May 1994

JEL No. F31

International Finance and
Macroeconomics

This paper studies the effect of the market's perceived exchange rate volatility on bid-ask spreads. I extract the anticipated volatility from data on currency options. An increase in the perceived volatility widens bid-ask spreads. The direction of the effect is consistent with an option model of the spread, although of smaller magnitude. An increase in trading volume of spot exchange rates also widens the spread. However, the omission of trading volume does not bias the estimate of the effect of the volatili-

ty on the spreads. Although the spread-volatility relationship implied by the option model of the spread is close to linear, some form of nonlinearity still can be detected from the data.

Insignificant and Inconsequential Hysteresis: The Case of U.S. Bilateral Trade

David C. Parsley and Shang-Jin Wei

NBER Working Paper No. 4738

May 1994

JEL Nos. F31, F32

International Trade and Investment,
International Finance and
Macroeconomics

This paper casts doubt on the validity of the hysteresis hypothesis as an explanation of the persistent U.S. trade deficits in the 1980s. We propose two tests to investigate two different implications of the hypothesis. The first implication is that cumulative changes in exchange rates, in addition to current exchange rate levels, are important determinants of trade flows. The second implication is that foreign exporting firms' perceptions of exchange rate volatility will affect their decisions to enter or exit the market. We find little support for either aspect of the hysteresis hypothesis.

The Bayesian Foundations of Learning by Doing

Boyan Jovanovic and Yaw Nyarko

NBER Working Paper No. 4739

May 1994

JEL No. O14

Productivity

This paper explores a one-agent Bayesian model of learning by doing and technological choice. To produce output, the agent can

choose among various technologies. The beneficial effects of learning by doing are bounded on each technology, and long-run growth in output can take place only if the agent repeatedly switches to other technologies.

As the agent repeatedly uses a technology, he learns about its unknown parameters; this accumulated expertise is a form of human capital. But when the agent switches technologies, part of this human capital is lost. It is this loss of human capital that may prevent the agent from moving up the quality ladder of technologies as quickly as he can, since the loss is greater as the technological leap increases.

In analyzing the global dynamics, we find that an agent rich in human capital may find it optimal to avoid any switching of technologies, and therefore to experience no long-run growth. On the other hand, an agent poor in human capital, who because of his lack of skill is not so attached to any particular technology, can find it optimal to switch technologies repeatedly, and therefore enjoy long-run growth in output. Thus, the model can give rise to overtaking.

The Legacy of Communist Labor Relations

David G. Blanchflower and Richard B. Freeman

NBER Working Paper No. 4740

May 1994

Labor Studies

This paper contrasts International Social Science Programme (ISSP) surveys for Hungary, supplemented with related survey data for East Germany, Poland, and Slovenia, with ISSP data for western countries. We examine the extent to which workers in traditionally communist societies differ from other workers in their attitudes to-

ward work conditions, wage inequality, the role of unions, and the role of the state in determining labor market outcomes. We find sufficiently marked differences in responses between Hungary and the other previously communist countries, and in western countries, to suggest that communism left an identifiable common legacy in the area of labor. The citizens of former communist countries exhibit a greater desire for egalitarianism, are less satisfied with their jobs, and are more supportive of state interventions in the job market and economy, than westerners. These differences suggest that the move to a market economy will be marked by considerable "social schizophrenia" because of the attitudinal legacy of the communist past.

Historical Factors in Long-Run Growth

The Relevance of Malthus for the Study of Mortality Today: Long-Run Influences on Health, Mortality, Labor Force Participation, and Population Growth

Robert W. Fogel

NBER Historical Paper No. 54
March 1994

This paper argues that the secular decline in mortality, which began during the eighteenth century, is still in progress and probably will continue for another century or more. I focus not only on the environment which, from the standpoint of human health and prosperity, has become much more favorable than it was in Malthus's time, but also on changes in human physiology over the past three centuries that affect both economic and biomedical processes. I em-

phasize the interconnectedness of events and process over the life cycle and, by implication, between generations.

Agricultural Decline and the Secular Rise in Male Retirement Rates

Dora L. Costa

NBER Historical Paper No. 55
April 1994
JEL Nos. N31, J26

Explanations for the decline in labor force participation rates of older men prior to 1950 have focused on the sectoral shift from agriculture to manufacturing: labor force participation rates of men living in farm households were consistently higher than those of other men, and the shrinking of the agricultural sector coincided with the rise in male retirement rates.

But using a new longitudinal dataset, I argue that at the beginning of the twentieth century, men who were farmers were no less likely to retire than other men were. Past researchers who examined cross-sectional data were misled, because retired farmers often migrated from their farms. These findings have implications for the secular decline of fertility.

Technical Papers

Split Sample Instrumental Variables

Joshua D. Angrist and Alan B. Krueger

NBER Technical Paper No. 150
January 1994
JEL No. C30
Labor Studies

Instrumental Variables (IV) estimates tend to be biased in the same direction as Ordinary Least Squares (OLS) in finite samples if the instruments are weak. To ad-

dress this problem, we propose a new IV estimator, Split Sample Instrumental Variables (SSIV), which works as follows: we randomly split the sample in half, and use one-half to estimate parameters of the first-stage equation. Then we use these estimated first-stage parameters to construct fitted values, and second-stage parameter estimates, using data from the other half of the sample. SSIV is biased toward zero, rather than toward the plim of the OLS estimate. However, we can calculate an unbiased estimate of the attenuation bias of SSIV. We use this estimate to derive an estimator that is asymptotically unbiased as the number of instruments tends to infinity, holding the number of observations per instrument fixed. We label this new estimator Unbiased Split Sample Instrumental Variables (USSIV). We apply SSIV and USSIV to the data we used in 1991 to estimate the payoff to education.

Instrumental Variables Regression with Weak Instruments

Douglas Staiger and James H. Stock

NBER Technical Paper No. 151
January 1994
Asset Pricing

This paper develops asymptotic distribution theory for instrumental variable regressions when the partial correlation between the instruments and a single included endogenous variable is weak, modeled here as local to zero. We provide asymptotic representations for various instrumental variable statistics, including the two-stage least squares (TSLS) and limited information maximum likelihood (LIML) estimators and their *t*-statistics. The asymptotic distributions provide good approximations to sampling distributions with just 20 obser-

vations per instrument. Even in large samples, TSLS can be biased badly, but LIML is, in many cases, approximately median unbiased. The theory suggests concrete quantitative guidelines for applied work. These guidelines help to interpret Angrist and Krueger's (1991) estimates of the returns to education; whereas TSLS estimates with many instruments approach the OLS estimate of 6 percent, the more reliable LIML and TSLS estimates with fewer instruments fall between 8 percent and 10 percent, with a typical confidence interval of (6 percent, 14 percent).

The Predictive Ability of Several Models of Exchange Rate Volatility **Kenneth D. West and Dongchul Cho**

NBER Technical Paper No. 152
January 1994
JEL Nos. C52, C53, F31
Asset Pricing, International Finance
and Macroeconomics

We compare the out-of-sample forecasting performance of univariate homoskedastic GARCH, autoregressive, and nonparametric models for conditional variances, using five bilateral weekly exchange rates for the dollar in 1973–89. For a one-week horizon, GARCH models tend to make slightly more accurate forecasts. For longer horizons, it is difficult to find grounds for choosing between the various models. None of the models performs well in a conventional test of forecast efficiency.

Assessing Specification Errors in Stochastic Discount Factor Models **Lars Peter Hansen and Ravi Jagannathan**

NBER Technical Paper No. 153
February 1994

JEL No. G12
Asset Pricing

In this paper, we develop alternative ways to compare asset pricing models when it is understood that their implied stochastic discount factors do not price all portfolios correctly. Unlike comparisons based on Chi-square statistics associated with null hypotheses that models are correct, our measures of model performance do not reward variability of discount factor proxies. One of our measures is designed to exploit fully the implications of arbitrage-free pricing of derivative claims. We demonstrate empirically the usefulness of methods in assessing some alternative stochastic factor models that have been proposed in asset pricing literature.

When Are Anonymous Congestion Charges Consistent with Marginal Cost Pricing?

Richard J. Arnott and Marvin Kraus

NBER Technical Paper No. 154
April 1994
JEL No. H2
Public Economics

There are constraints on pricing congestible facilities. First, if heterogeneous users are observationally indistinguishable, then congestion charges must be anonymous. Second, the time variation of congestion charges may be constrained. Do these constraints undermine the feasibility of marginal cost pricing, and hence the applicability of the first-best theory of congestible facilities? We show that if heterogeneous users behave identically when using the congestible facility, and if the time variation of congestion charges is unconstrained, then marginal cost pricing

is feasible with anonymous congestion charges. If, however, the time variation of congestion charges is constrained, optimal pricing with anonymous congestion charges entails Ramsey pricing.

Small Sample Properties of Generalized Method of Moments Based Wald Tests **Craig Burnside and Martin Eichenbaum**

NBER Technical Paper No. 155
May 1994
JEL Nos. C5, C12
Economic Fluctuations

This paper assesses the small sample properties of Generalized Method of Moments (GMM) based Wald statistics. We assume that the data-generating process corresponds to a simple vector white noise process, and an equilibrium business cycle model. Our key findings are that: 1) the small sample size of the Wald tests exceeds their asymptotic size; and 2) their size increases uniformly with the dimensionality of joint hypotheses. For tests involving even moderate numbers of moment restrictions, the small sample size of the tests greatly exceeds their asymptotic size. Relying on asymptotic distribution theory leads one to reject joint hypothesis tests *far* too often. We argue that the source of the problem is the difficulty in estimating the spectral density matrix of the GMM residuals, which is needed to conduct inference in a GMM environment. Imposing restrictions implied by the underlying economic model being investigated, or the null hypothesis being tested, on this spectral density matrix can lead to substantial improvements in the small sample properties of the Wald tests.



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