NBER Reporter

NATIONAL BUREAU OF ECONOMIC RESEARCH, INC. SUMMER 1992

Program Report

Monetary Economics and Financial Markets: Retrospect and Prospect

Benjamin M. Friedman

The National Bureau's program of research in financial markets and monetary economics (FMME) began its activities just over a dozen years ago. The underlying motivation was to bring together, in so far as is possible, the artificially disparate lines of research typically carried out in economics departments under the label "monetary economics" and in business schools under the "finance" heading.

Monetary economics is, by definition, the study of economies in which financial assets not only exist but, indeed, are central to important aspects of economic behavior both at the individual level and in regard to aggregate economic outcomes. One major focus of research in finance is how speculative markets establish the prices of financial assets—clearly a crucial issue for understanding the role that these assets play in a broader economic context. Another focus of finance research is the behavior of those institutions, be they nonfinancial businesses or financial intermediaries, whose actions collectively comprise much of what are conventionally called financial markets and, at the same time, provide key links relating those markets to real economic activity. It is hardly surprising, therefore, that the connections between monetary economics and finance are close and direct.

The object of the FMME program has been to exploit and foster these connections. Researchers participating in the program have come from both economics departments and business schools. Papers presented at meetings and conferences have spanned subjects ranging from the economic impact of monetary policy to the potential efficacy of stock market trading rules to the investment behavior of corporations facing borrowing constraints. The issues chosen for collaborative projects—for example, the study of the changing roles of debt and equity in financing U.S. capital formation, carried out by members of the program in the mid-1980s—have likewise encompassed not only monetary economics subjects and finance subjects but also, importantly, the intersection of the two.

After a dozen years it is now time for a change—not because the program's initial strategy did not succeed (it did) but because the explosion of research, and researchers, in the field has finally rendered that course practically unworkable. There is simply too much high-quality empirical research now underway in these areas for the National Bureau to incorporate into a single program without sacrificing the depth and intensity that distinguish a genuine research program from a conference series. And there are far too many first-class scholars doing interesting work in these areas to include in one program if it is to provide real opportunities for active participation.

In This Issue

This issue of the *Reporter* highlights the three new successor programs to the Bureau's Program in Financial Markets and Monetary Economics. Next, J. Bradford De Long describes his research in growth, industrialization, and finance. After biographical sketches, news of NBER conferences, and other NBER news and reports, the *Reporter* concludes with short summaries of recent Working Papers.

Preparation of the *NBER Reporter* is under the supervision of Donna Zerwitz.

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Beginning this past year, therefore, three new research programs have taken the place of the FMME program. I now direct a new program on Monetary Economics, with N. Gregory Mankiw (from Harvard) as Associate Director. John Y. Campbell (from Princeton) now directs a new program on Asset Pricing. Robert W. Vishny (from the University of Chicago) now directs a new program on Corporate Finance. Each of these programs already has met at least twice, with much success from exploiting both the new, narrower focus and the smaller size. Each offers prospects for future activities that will generate genuine intellectual excitement and, if past experience is any guide, will lead to much useful research.

The evolution of the FMME program into these three successor programs offers an opportunity to put into perspective the changing directions and presumptions that have shaped research in this entire field over the past dozen years. In each of these three areas—monetary economics, asset pricing, and corporate finance—the intellectual center of gravity has visibly shifted during this period. Interestingly, in each area these changes in research direction have reflected, to a significant degree, the influence of unfolding economic and financial developments.

Monetary Economics

As of the late 1970s, much of the newest research in monetary economics embraced the view that the growth of the money stock (however defined) satisfactorily summarized the macroeconomically relevant doings of the central bank; that money growth affected real economic activity only to the extent that it was unexpected; and, as a direct consequence of the first two notions, that a central bank could achieve disinflation with little if any cost in terms of foregone production, employment, or incomes, simply by reducing money growth according to a schedule publicly announced in advance. To be sure, not every researcher in the field embraced these precepts. Indeed, several interesting lines of research at that time consisted primarily of setting forth challenges to them. Even so, the prevalence of this general view among academic researchers had reached a high point.

The events of the 1980s, especially in the United States, were not kind to this set of presumptions. In the wake of financial deregulation, disinflation, and the progressive globalization of financial markets, standard relationships connecting money growth to either income growth or price inflation more or less collapsed. The conventional "M's" not only no longer seemed sufficient to guide monetary policy; they no longer provided much empirically identifiable information about anything of interest in a monetary policy context. Depending on one's interpretation of events, preannounced slowing of money growth either proved to be a nonoperational concept,

in that some M's accelerated while others decelerated, or simply failed to deliver the results promised. Tight monetary policy, visible dimly in the slowing of some measures of money growth but much more clearly in record level interest rates (both nominal and real), did achieve a sharp disinflation in the early 1980s. But it did so at the expense of a downturn in nonfinancial economic activity that was, by many measures, the most severe since the Depression of the 1930s. And once the recession ended, a half-decade of record high money growth brought no increase in inflation whatever.

These events have importantly influenced research throughout the monetary economics field, including research carried out within the FMME program. Increasingly, the question at issue in much of this research is not whether anticipated monetary policy actions affect business activity but by what mechanism(s) they do so—or, to put the same point in a way that more fully brings out the newer research agenda, not whether but how and why the markets that matter in this context are imperfect.[1] At the same time, how to fill the vacuum left by the demise of the M's as reliable policy guides has become an ever more pressing question, for researchers no less than for policymakers:[2] Money growth still rules, but with some adaptive feedback to allow for shifts in "velocity"? Interest rates? Interest rate spreads? Maybe even stock prices? And what about the role of exchange rates, especially since so many European central banks, even in advance of formal monetary unification, have conducted their respective monetary policies primarily by pegging their currencies to the Deutschemark? A more catholic, inquiring approach to the practical questions created by the need to conduct actual monetary policy in real time has paralleled the more open-minded approach to positive questions of economic behavior. Overall, research in monetary economics has changed substantially over those years, and it is continuing to do so.

Asset Pricing

The events of the 1980s as a whole spurred major changes in monetary economics research. The events of one day in the 1980s spurred a similar change in the dominant direction of research on the pricing of financial assets.

Here, too, it would be incorrect to argue that all research in the field a dozen years ago (or five years ago, for that matter) simply assumed the efficiency of speculative asset markets. But the 18 percent one-day drop in stock prices on October 19, 1987, in the absence of any visibly extraordinary "news" plausibly affecting fundamental values, sharply increased the willingness to explore—indeed, even to entertain—mechanisms by which speculative markets might establish asset prices on grounds unrelated to such fundamentals as expected future cash flows and risk-appropriate discount rates.

The heart of this more open approach has been the realization that asset markets in the modern economy exhibit social as well as economic behavior in the strict sense. In other words, the interactions among participants in the markets under study are far richer than standard skeletal textbook abstractions typically imply, and under some circumstances those interactions themselves can be the substance, rather than just the process, of asset pricing. Given this alternative presumption, the relevant question is then what potentially observable (or at least inferable) aspects of those interactions might account for a significant share of the observed variation of asset prices.

One line of research addressing this question emphasizes the incompleteness of available information and the resulting incentive of market participants to attempt to learn by observing the actions of other participants.

[1] *Just a partial list of examples of this kind of research, compiled (as in the notes that follow) from among papers written within the two years since I last summarized FMME program activities in the* NBER Reporter, *includes: L. M. Ball, "Disinflation with Imperfect Credibility," NBER Working Paper No. 3983, February 1992; B. S. Bernanke and A. S. Blinder, "The Federal Funds Rate and the Channels of Monetary Transmission," NBER Working Paper No. 3487, October 1990; B. S. Bernanke and H. James, "The Gold Standard, Deflation, and Financial Crisis in the Great Depression: An International Comparison," NBER Working Paper No. 3488, October 1990; M. D. Bordo, P. Rappoport, and A. J. Schwartz, "Money versus Credit Rationing: Evidence for the National Banking Era, 1880–1914," NBER Reprint No. 1716, May 1992; L. J. Christiano and M. S. Eichenbaum, "Identification and the Liquidity Effect of a Monetary Policy Shock," NBER Working Paper No. 3920, November 1991, and "Liquidity Effects and the Monetary Transmission Mechanism," NBER Working Paper No. 3974, January 1992; M. Gertler and S. Gilchrist, "Monetary Policy, Business Cycles, and the Behavior of Small Manufacturing Firms," NBER Working Paper No. 3892, November 1991; A. K. Kashyap, J. C. Stein, and D. W. Wilcox, "Monetary Policy and Credit Conditions: Evidence from the Composition of External Finance," NBER Working Paper No. 4015, March 1992; and C. D. Romer, "What Ended the Great Depression?" NBER Working Paper No. 3829, September 1991.*

[2] *The National Bureau does not sponsor work directly advocating policy positions, in this area or any other. Much Bureau-sponsored research does shed light, however, on analytical and empirical issues that are relevant to economic policy. Examples of new research along the lines indicated above include: B. S. Bernanke, "On the Predictive Power of Interest Rates and Interest Rate Spreads," NBER Working Paper No. 3486, October 1990; M. D. Bordo and A. J. Schwartz, "What Has Foreign Exchange Market Intervention Since the Plaza Agreement Accomplished?" NBER Reprint No. 1604, September 1991; J. A. Frankel and C. S. Lown, "An Indicator of Future Inflation Extracted from the Steepness of the Interest Rate Yield Curve Along Its Entire Length," NBER Working Paper No. 3751, June 1991; B. M. Friedman and K. N. Kuttner, "Why Does the Paper-Bill Spread Predict Real Economic Activity?" NBER Working Paper No. 3879, October 1991; N. G. Mankiw and J. A. Miron, "Should the Fed Smooth Interest Rates? The Case of Seasonal Monetary Policy," NBER Reprint No. 1646, October 1991; F. S. Mishkin, "Yield Curve," NBER Working Paper No. 3550, December 1990; R. A. Pecchenino and R. H. Rasche, "P* Type Models: Evaluation and Forecasts," NBER Working Paper No. 3406, August 1990; and J. J. Rotemberg, J. M. Poterba, and J. C. Driscoll, "Money, Output, and Prices: Evidence from a New Monetary Aggregate," NBER Working Paper No. 3824, August 1991.*

Under some conditions, this kind of behavior can impart to what would otherwise be negligible random price fluctuations a momentum that can dominate movements attributable to changes in fundamentals. A parallel approach emphasizes more direct ways in which market participants—again, seeking to make up for the lack of perfect information—affect one another's opinions and hence the prices at which they are willing to buy or sell. Yet a third approach focuses on protective trading schemes by which market participants individually seek to limit their potential losses but collectively generate cumulative price movements that result in much greater losses (for some) than would otherwise occur.[3]

What these and other related lines of research have in common is some mechanism by which speculative behavior that is rational within an appropriately specified context magnifies random price movements, instead of damping them as the standard theory of speculation implies. (In this sense, these lines of financial research share a basic outlook with macroeconomic theories that generate business fluctuations instead of equilibrium from shocks that are multiplied instead of damped.) These theories therefore lend themselves quite directly to application in investigations of the features of asset returns—for example, skewness and "fat tails" ("too many" large observations) that have long attracted researchers' attention. Those applications in turn have potentially interesting implications for such practical aspects of financial asset markets as trading rules, pricing of options and other derivative instruments, and "portfolio insurance."

Corporate Finance

Finally, research in corporate finance has also responded to the ongoing events of the time. In this case, the major event of the 1980s was the leveraging of corporate America. U.S. nonfinancial corporations not only borrowed in record volume during the 1980s but, to an unprecedented extent, did so to engage in financial leveraging—that is, to pay down equity—rather than to create new fixed assets. From the perspective of the economy's corporate sector as a whole, leveraged buyouts and debt-financed mergers and acquisitions represent a pure substitution of debt for equity. Stock repurchases do too, even at the level of the single firm.

All this leveraging activity has raised several interesting questions. First, what explains the readily visible change in the typical firm's value during the course of any of these transactions? More specifically, which of the many ways in which actual financial markets differ from the conditions assumed in Modigliani and Miller's famous invariance proposition (according to which none of this should matter) accounts for the great increase in "value" following a high leverage transaction? What does the inferred importance of that feature then imply about how actual markets perform their task in a capitalist, free enterprise economy? Or about the distortions imposed by government through taxation and regulation? Or about the behavior of financial intermediaries and the soundness of a financial system that holds the large volumes of liabilities created in these transactions? And what impact does sharply higher leverage exert on nonfinancial corporations' ability or willingness to undertake capital spending? Or research and development?[4]

A second set of research questions is, in effect, the reverse of the first. For all the leveraging that took place in the 1980s, not every would-be borrower found credit available at acceptable cost. What distinguishes those firms that are able to borrow, from those that cannot? Theories of credit restriction based on asymmetric information were well established in the theoretical literature by the mid-1970s, but the experience of the 1980s has given new thrust to their empirical implementation. Here the answers speak not just to conceptual issues of cor-

[3] *Representative examples include: F. Allen and G. Gorton, "National Finite Bubbles," NBER Working Paper No. 3707, May 1991; R. B. Barsky and J. B. De Long, "Why Does the Stock Market Fluctuate?" NBER Working Paper No. 3995, February 1992; J. Y. Campbell and L. Hentschel, "No News Is Good News: An Asymmetric Model of Changing Volatility in Stock Returns," NBER Working Paper No. 3742, June 1991; J. M. Cochrane, "Volatility Tests and Efficient Markets: A Review Essay," NBER Reprint No. 1701, March 1992; J. Dow and G. Gorton, "Trading. Communication, and the Response of Price to New Information," NBER Working Paper No. 3687, April 1991; K. A. Froot and A. F. Perold, "New Trading Practices and Short-Run Market Efficiency," NBER Working Paper No. 3498, October 1990; C. Lee, A. Shleifer, and R. Thaler, "Investor Sentiment and the Closed-End Fund Puzzle," NBER Working Paper No. 3465, October 1990; J. Lakonishok, A. Shleifer, and R. W. Vishny, "Do Institutional Investors Destabilize Stock Prices? Evidence on Herding and Feedback Trading," NBER Working Paper No. 3846, September 1991; F. S. Mishkin, "Asymmetric Information and Financial Crises: A Historical Perspective," NBER Reprint No. 1588, August 1991; R. J. Shiller and A. E. Beltratti, "Stock Prices and Bond Yields: Can Their Movements Be Explained in Terms of Present-Value Models?" NBER Working Paper No. 3464, October 1990; and R. J. Zeckhauser, J. Patel, and D. Hendricks, "Nonrational Actors and Financial Market Behavior," NBER Working Paper No. 3731, June 1991.*

[4] *See, for example, P. Asquith, R. Gertner, and D. S. Scharfstein, "Anatomy of Financial Distress: An Examination of Junk Bond Issuers," NBER Working Paper No. 3942, December 1991; J. B. De Long, "Did J. P. Morgan's Men Add Value? A Historical Perspective on Financial Capitalism," NBER Working Paper No. 3426, August 1990; B. M. Friedman, "Views on the Likelihood of Financial Crisis," NBER Reprint No. 1617, October 1991; M. Gertler and R. G. Hubbard, "Corporate Financial Policy Taxation and Macroeconomic Risk," NBER Working Paper No. 3902, November 1991; S. N. Kaplan and J. C. Stein, "How Risky Is the Debt in Highly Leveraged Transactions?" NBER Reprint No. 1602, September 1991, and "The Evolution of Buyout Pricing and Financial Structure," NBER Working Paper No. 3695, May 1991; and S. N. Kaplan and M. Weisbach, "The Success of Acquisitions: Evidence from Divestitures," NBER Working Paper No. 3484, October 1990.*

porate finance but to such matters as what makes banks (as opposed to other lenders) special, and what biases to real economic activity follow from the credit restrictions that markets impose (whatever the reasons).[5]

Finally, comparison of the U.S. experience with that abroad also presents interesting issues that empirical researchers are only just beginning to investigate. While the 1980s wave of leveraging transactions was mostly an American phenomenon, high leverage per se is not. Indeed, German corporations and (depending on the accounting conventions used) Japanese corporations typically rely on debt to an even greater extent than their U.S. counterparts. But the financial systems in these countries differ too. There is no direct U.S. equivalent of the German system of the lead bank, as equity holder and management supervisor, or of the Japanese keiretsu system. In light of these different market structures, are direct comparisons appropriate? Or do identical leverage ratios imply different levels of risk in different countries? If so, what does that mean for the familiar debate over whether international differences in the cost of financial capital render a given country's industry either advantaged or disadvantaged in meeting foreign competition in the product markets?[6]

With such a rich menu of research issues in each of these three areas—and this brief survey is far from comprehensive—having a separate research program in each one clearly will provide not just a greater opportunity but a much needed framework for in-depth discussion and collaboration. No doubt the fruits of those efforts will appear as new research soon, forthcoming from each of these new National Bureau groups.

[5]*See, for example, M. Gertler and S. Gilchrist, "Monetary Policy, Business Cycles, and the Behavior of Small Manufacturing Firms," NBER Working Paper No. 3892, November 1991; M. Gertler, R. G. Hubbard, and A. K. Kashyap, "Interest Rate Spreads, Credit Constraints, and Investment Fluctuations: An Empirical Investigation," NBER Working Paper No. 3495, October 1990; B. C. Greenwald and J. E. Stiglitz, "Information, Finance, and Markets: The Architecture of Allocative Mechanisms," NBER Working Paper No. 3652, March 1991; and A. Shleifer and R. W. Vishny, "Asset Sales and Debt Capacity," NBER Working Paper No. 3618, February 1991.*

[6]*Although interest in this subject is only just on the increase, research that bears on these questions includes: A. Demirguc-Kunt, H. Unal, and E. J. Kane, "Capital Positions of Japanese Banks," NBER Reprint No. 1654, October 1991; K. R. French and J. M. Poterba, "Japanese and U.S. Cross-Border Common Stock Investments," NBER Reprint No. 1537, March 1991; and T. Hoshi, A. K. Kashyap, and D. Scharfstein, "The Role of Banks in Reducing the Costs of Financial Distress in Japan," NBER Working Paper No. 3435, September 1990.*

Research Summary

Growth, Industrialization, and Finance

J. Bradford De Long

Machinery Investment and Economic Growth

There was an extraordinary explosion in material wealth during the twentieth century. The estimates found in historical national income accounts—which are conservative—tell us that citizens of industrial nations today are more than ten times as rich as their predecessors of a century ago. Such a rapid pace of increase in wealth is unprecedented: even the nineteenth century, with the Industrial Revolution, saw at most a doubling of material wealth in industrial nations; in earlier centuries, standards of living were almost as likely to decline as to rise.

Most economies in the world have shared in the extraordinary growth of material wealth in the twentieth century, but nations have not shared equally. The wealth of the industrial nations has advanced rapidly. Some of the less industrialized—such as Japan and Italy—have caught up to the productivity levels of the world's industrial leaders, while others have experienced relative stagnation. Some economies, such as Argentina's, have lost substantial ground relative to the industrial core. Economies have not "converged" in productivity levels and standards of living over the past century.[1]

The NBER Project in Economic Growth has been motivated in large part by our lack of clear understanding of the reasons for this diverging wealth of nations,[2] and in part by new thinking about economic growth.[3] I have focused on one narrow piece of the puzzle: the role of investment in machinery in generating productivity growth.

[1]*J. B. De Long, "Have Productivity Levels Converged? Productivity Growth, Convergence, and Welfare in the Very Long Run," NBER Working Paper No. 2419, October 1987. A substantially shortened version appeared as J. B. De Long, "Productivity Growth, Convergence, and Welfare: Comment,"* American Economic Review *78, 5 (December 1988), pp. 1138–1154.*

[2]*The project is directed by Robert J. Barro and Paul M. Romer. The May 1991* Quarterly Journal of Economics *is devoted to recent research on economic growth, much of it conducted under the auspices of the NBER economic growth project.*

[3]*New thinking largely sparked by P. M. Romer, "Increasing Returns and Long-Run Growth,"* Journal of Political Economy *(October 1986), pp. 1002–1037.*

There are strong theoretical reasons to believe that machinery investment is a key factor in economic growth. Machinery investment is the single most indispensable prerequisite for industrialization, and the tremendous expansion of productivity and wealth over the past century is closely connected with industrialization: we speak of the first, second, and now the third "industrial revolutions." To the extent that increased productivity is driven by the increased productiveness of newly invented technologies, machinery investment also should play a key role: much of modern industrial technology is *embodied* in machinery, and cannot be used at all without heavy preliminary investments in the necessary equipment.

My first study of machinery investment and growth, conducted with Lawrence H. Summers, used data constructed by Robert Summers and Alan Heston to analyze the comparative growth rates of 61 nonoil-exporting market economies during 1960–85.[4] Figure 1 depicts the cross-country pattern of machinery investment and economic growth that we found. The figure controls for the effects on economic growth of different rates of population growth, of nonmachinery investment, and of the initial "technology gap" in 1960 vis-à-vis the world's industrial leaders, showing graphically what the association between economic growth and machinery investment would have been if all of these other factors had been constant across nations.

Figure 1 shows a very strong correlation between machinery investment and productivity growth.[5] A three percentage point difference in the share of national product devoted to machinery investment—the difference between 2 and 5 percent, say, in machinery investment as a share of national product—was associated with a one percentage point increase in the annual growth rate of output per worker—the difference, say, between a growth rate of 2 and 3 percent per year.

From 1960 to 1985, such differences in growth rates cumulate: by the end of the 25-year sample, the faster-growing economy has become 28 percent richer. If this strong association exists because high machinery investment causes rapid growth, it would require a social rate of return on investment in machinery of 30 percent per year—a magnitude far exceeding the extra private profits realized by firms that invest in machinery, which on net average about 10 percent per year.

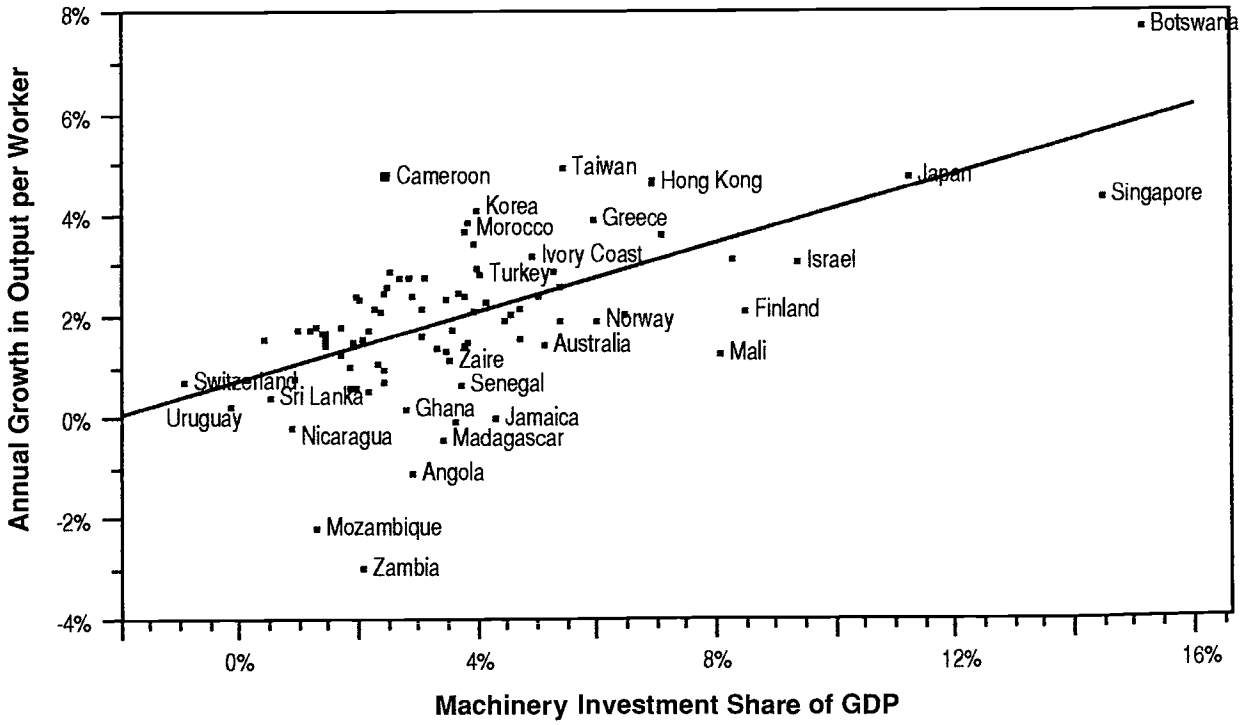
Summers and I (1991) argue that this close association between machinery investment and growth was not a statistical artifact, caused by the omission of some key factor from the list of potential causes of growth. No matter which sets of growth-causing factors we considered,[6] the rate of machinery investment remained the

[4] *R. Summers and A. Heston, "The Penn World Table (Mark 5): An Expanded Set of International Comparisons, 1950–88," NBER Reprint No. 1562, May 1991, and* Quarterly Journal of Economics *106, 2 (May 1991), pp. 327–368.*

[5] *J. B. De Long and L. H. Summers, "Equipment Investment and Economic Growth," NBER Working Paper No. 3515, November 1990, and* Quarterly Journal of Economics *106, 2 (May 1991), pp. 445–502.*

[6] *Including the list of politico–economic factors used in R. J. Barro, "Economic Growth in a Cross Section of Countries," NBER Reprint No. 1596, September 1991, and* Quarterly Journal of Economics *106, 425 (May 1991), pp. 407–443.*

Figure 1 Partial Scatter Plot of 1960–85 Growth and Machinery Investment



most important factor for determining rates of economic growth; each one percentage point shift in the share of machinery investment in national product continued to be associated with a one-third of a percentage point shift in the annual rate of economic growth.

It is important to note that the close association is between growth and investment in *machinery*, not growth and investment in general. The association between growth and nonmachinery investment is much weaker. There is no sign that investment not devoted to machinery produced social gains in terms of added productivity any larger than the private profits received by investing firms.

My more recent work has explored the contribution of machinery investment to growth in other periods and other economies. So far the strong growth–machinery investment association has proven remarkably robust. My 1992 paper finds the same strong growth–machinery investment association present in a small sample of seven industrial nations for which data since 1870 exist,[7] both before and after World War II. Joint work in progress with Summers finds the same strong association between machinery investment and growth in a sample of 27 economies not included in the data we analyzed in 1991, in a sample of OECD nations for which higher-quality data exist, and in the 1950s as well as in 1960–85.[8]

[7] *J. B. De Long, "Productivity and Machinery Investment: A Long-Run Look, 1870–1980," NBER Working Paper No. 3903, November 1991, and* Journal of Economic History *53, 2 (June 1992).*

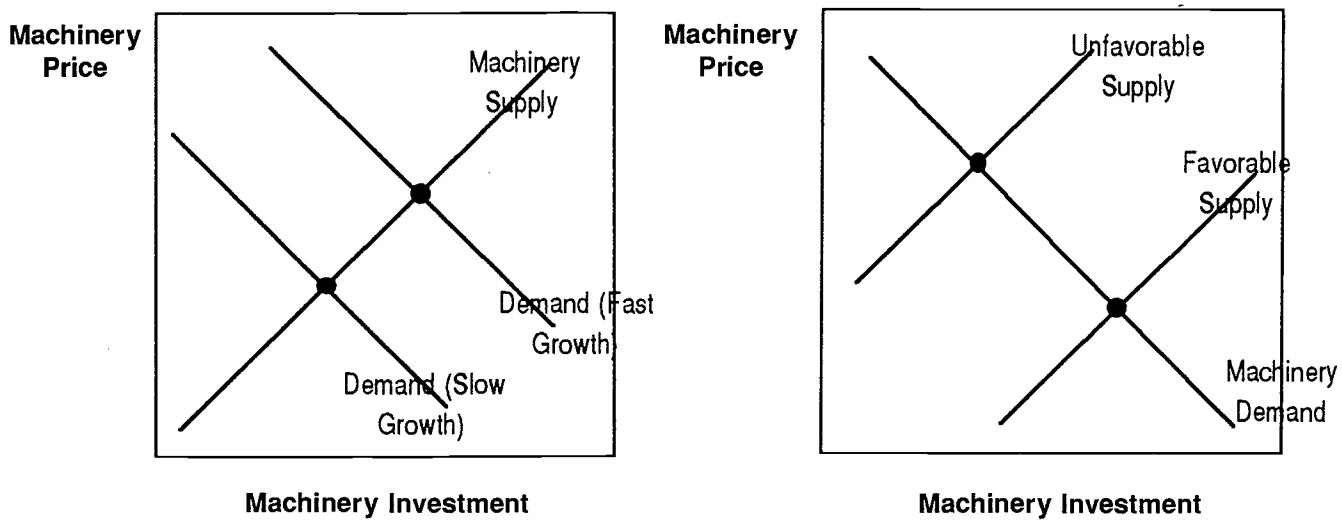
[8] *J. B. De Long and L. H. Summers, "How Robust Is the Growth–Machinery Nexus?" forthcoming.*

In my 1991 work with Summers and my 1992 paper, I present evidence that a high rate of machinery investment does significantly boost productivity. In the final analysis, the argument that I find most convincing is a simple supply-and-demand one. If fast growth driven by other factors were the cause, and a high rate of machinery investment were the effect, then it would be because fast growth raised the prospective profits of investing firms and thus increased their demand for machinery. If supply conditions are fixed, then when demand is high, prices are high. If fast growth is the cause and high machinery investment is the effect, then fast growth, high machinery investment, and high machinery prices should all go together, as in the first panel of Figure 2.

Suppose, on the other hand, that a high rate of machinery investment is the result not of high demand but favorable supply, and that the high rate of machinery investment is the cause and fast growth the effect. If demand is unchanged, then when supply conditions are favorable, prices are low. In this case, rapid growth and high machinery investment would go not with high but with low machinery prices, as in the second panel of Figure 2.

In fact, high machinery investment shares in national product (and rapid growth) go with low machinery prices and, in developing countries, with an absence of tariffs and import restrictions that would make the importation of machinery from advanced industrial economies expensive and difficult. The observed pattern of machinery prices, rates of machinery investment, and growth confirms that machinery investment is a key factor in economic growth. It provides macroeconomic support for the belief that investment in machinery yields large social benefits, both directly through the more advanced technologies embodied in new machinery, and indirectly by increasing the skills of workers in handling and the

Figure 2 Growth, Machinery Investment, and Machinery Prices



experience of firms in organizing modern technologies.[9] Comparing across countries the apparent boost to productivity associated with machinery investment suggests that these social benefits amount to about three times the extra private profits received by firms that invest in machinery and equipment.

Such a close association between machinery and growth, and the strong case for interpreting this association as causal, support the "new thinking" on growth derived largely from the work of Paul M. Romer.[10] He stresses the connection between productivity growth and investment broadly defined, and sees large gaps between private profitability and the social utility of investment. I also support a conception of the process of economic growth and development emphasizing industrialization and mechanization, through which economies acquire and learn how to use the capital equipment that embodies so much modern industrial technology.

Financial Capitalism and Industrial Development

What distinguishes economies with high rates of machinery investment and economic growth from those without? Some determinants of high machinery investment are straightforward. Such economies have a high rate of private savings. Their governments on average run surpluses or at worst small deficits, so as not to pull capital that otherwise would be devoted to investment into financing current government-funded consumption. Capital goods are relatively cheap and easy to purchase—and, since even in rich economies a large proportion of capital goods is imported, low prices of capital goods generally are found only where tariffs are low and there are few nontariff barriers restricting trade.[11]

But even a high national savings rate, a balanced government budget, and a commitment to free trade do not guarantee a high rate of machinery investment. In Great Britain in the third of a century before World War I, for example, machinery investment was relatively low. Firms hesitated to issue bonds or raise equity on the stock market, and their rates of expansion were relatively slow. Investors preferred to lend to foreign and colonial governments. The result was that British growth slowed before World War I, and British firms had only a small place in the rapidly growing industries that were "high technology" in the 1890s. As W. Arthur Lewis has written of the high technology industries of the turn of the last century: "Organic chemicals became a German industry; the motor car was pioneered in France and mass-produced in the United States; Britain lagged in the use of electricity [and] depended on foreign firms. . . . The telephone, the typewriter, the cash register, and the diesel engine were all exploited by others."[12] Britain failed to turn its high savings rate and position as leading industrial nation into a strong capacity to produce high technology goods. The United States and Germany rapidly improved their levels of productivity.

Why can some economies, but not others, smoothly channel savings into leading-edge firms for investment? Investment banks have played an important intermediary role in this process. I examine the role played by the firm of J. P. Morgan and Company—America's largest and most influential turn-of-the-century investment banking partnership—in channeling capital to investing firms and creating a market for their debt and equity securities.[13]

I conclude that Morgan indeed offered services of enough value to investors and firms that they more than covered Morgan's very handsome fees and significantly smoothed the way for turn-of-the-century industrial firms to tap the savings of potential investors. Companies closely associated with Morgan had higher ratios of market-to-book-value, and higher ratios of earnings-to-book-capital-stock than did companies that lacked the Morgan connection, amounting to about one-third of their total equity value.

There is some evidence that the Morgan partnership carefully monitored firm executives and replaced poorly performing managers. There is considerable evidence that investors' willingness to commit their capital to firms was enhanced significantly by the knowledge that the Morgan partnership felt itself responsible for the firm's good performance. And there is considerable evidence that Morgan-influenced firms were able to tap into the capital market more easily, and were not constrained in their investment plans by their ability to generate internal cash flows.[14]

In large part the close links between the Morgan partnership and the firms it helped to finance appear to have been desirable because of the separation of ownership

[9] *K. Arrow, "The Economic Implications of Learning by Doing,"* Review of Economic Studies *29 (February 1962), pp. 155–173, and R. Solow, "Growth Theory and After,"* American Economic Review *78 (June 1988), pp. 307–317.*

[10] *P. M. Romer, "Capital, Labor, and Productivity,"* Brookings Papers on Economic Activity *(1990), and "Endogenous Technological Change,"* Journal of Political Economy *98, 5 (October 1990), pp. S71–S109.*

[11] *A. Warner, "Debt, Trade, and Investment," Cambridge, MA: Harvard University Ph.D. Dissertation, 1991.*

[12] *W. A. Lewis,* Growth and Fluctuations, *London: Allen and Unwin, 1978.*

[13] *J. B. De Long, "Did J. P. Morgan's Men Add Value? An Economist's Perspective on Financial Capitalism," NBER Working Paper No. 3426, August 1990, and in P. Temin, ed.,* Inside the Business Enterprise: Historical Perspectives on the Use of Information, *Chicago: University of Chicago Press, 1991, pp. 205–236.*

[14] *C. Ramirez, "Did J. P. Morgan's Men Add Liquidity?" Cambridge, MA: Harvard University xerographic copy, 1991.*

and control. In an environment in which few stockholders have a substantial ownership stake, their interests will be underrepresented unless financial institutions have the incentives and the ability to act as shareholders' agents. Investors' belief that the Morgan firm would be their "honest broker" appears to have been an important prerequisite for investors' willingness to commit their funds to Morgan-influenced companies.

The microeconomic evidence I examine suggests that a well-functioning financial system is another key factor necessary for firms to be able to expand and invest in modern technologies fast enough to keep them, and their economies, near the best-practice technological frontier. Close links between financial institutions and operating firms—links like those found in contemporary Japan and Germany or in the turn-of- the-century United States—are an important part of a well-functioning financial system able to channel savings to investing firms in growing high technology industries.

The Stock Market as a Forecasting Mechanism

Well-functioning financial markets do much more than channel savings into rapidly expanding high technology firms with high capital requirements. How the stock market values firms has a significant effect on rnany facets of the economy. If stock market values are volatile, investors will tend to be less willing to hold equities because of their high riskiness. If stock market values are low, firms wishing to expand will find it more expensive to build their own new plant and equipment than to buy buildings and machinery from other businesses. Investment will be relatively low when firms buy rather than build their capital.

The stock market serves as a mechanism for social calculation and capital allocation: it provides investors, manufacturers of capital goods, and firms thinking of expansion with information about the balance of present-day costs and likely future profits and other benefits from new investments. If the forecasts of future profits implicitly provided by stock market valuations are poor, or if the market's implicit forecasts are not consistent but change excessively from year to year, then there is reason to worry about whether the stock market is performing well in this role.

According to Milton Friedman,[15] the stock market's valuations can be thought of as an average of individual investors' valuations, with each individual's opinion weighted by his or her wealth. Investors who make bad forecasts wlll tend to lose money over time: they will misjudge the market, buy high, and sell low. As their wealth falls, their voice in determining stock market valuations will diminish: in the long run, the stock market will be dominated by those who have demonstrated their superior skill in forecasting by making money.

In a series of articles,[16] Robert J. Waldmann, Summers, Andrei Shleifer, and I argue that Milton Friedman's classic argument was not correct. Poorly informed and irrational investors take more risks than do those skilled at assessing values and making forecasts, and the stock market pays higher returns to risk-takers. Smart-money investors do not so much buy low as buy when returns look favorable adjusting for risk; traders whose views are not well founded but merely "noise" do not so much buy high as buy when risks are too great to make securities attractive to smart-money investors. In our models of the stock market, there is no tendency for the "noise" to fall over time, or for "noise traders" to lose money and exit the market.

In the past decade, many empirical studies of the U.S. stock market's performance in forecasting profits and profitability have found it wanting. If the stock market had valued equities using some very simple forecasting rules—setting the current value of an index of stocks to 20 times its current dividends, or to a similar multiple of moving averages of past dividends or earnings—then its prices over the past century would have provided investors and firms with better implicit forecasts of the future than actual prices did.[17]

Robert B. Barsky and I show that this apparent poor performance of the U.S. stock market is largely the result of investors' extrapolation of past dividend growth rates into the future.[18] We go on to argue that such extrapolation is a reasonable procedure given investors' lack of knowledge about likely future growth. Even today we cannot estimate precisely what the long-run trend growth rate of dividends is. Investors in the past had even less information about the trend rate of dividend growth, and of economic growth in general. The poor

[15] *M. Friedman,* Essays in Positive Economics, *Chicago: University of Chicago Press, 1953.*

[16] *J. B. De Long, A. Shleifer, L. H. Summers, and R. J. Waldmann, "Noise Trader Risk in Financial Markets," NBER Working Paper No. 2395, October 1987, and* Journal of Political Economy *98, 4 (August 1990), pp. 703–738; "The Size and Incidence of Losses from Noise Trading," NBER Working Paper No. 2875, March 1989, and* Journal of Finance *44, 3 (July 1989), pp. 681–696; "Positive-Feedback Investment Strategies and Destabilizing Rational Speculation," NBER Reprint No. 1330, December 1989, and* Journal of Finance *45, 2 (June 1990), pp. 374–394; and "The Survival of Noise Traders in Financial Markets," NBER Working Paper No. 2715, September 1988, and* Journal of Business *64, 1 (January 1991), pp. 1–20.*

[17] *R. J. Shiller,* Market Volatility, *Cambridge, MA: MIT Press, 1989; and J. H. Cochrane, "Volatility Tests and Efficient Markets: A Review Essay," NBER Reprint No. 1701, March 1992, and* Journal of Monetary Economics *27, pp. 463–485.*

[18] *R. B. Barsky and J. B. De Long, "Bull and Bear Markets in the Twentieth Century," NBER Working Paper No 3171, November 1989, and* Journal of Economic History *50, 2 (June 1990), pp. 1–17, and "Why Does the Stock Market Fluctuate?" NBER Working Paper No. 3995, February 1992.*

performance of the U.S. stock market well may be simply a result of the difficulty of the task of forecasting the future and the plausibility of extrapolation, and not a sign of investors' gross irrationality.

We also observe that analysts, often viewed as "smart money" themselves, assessed fundamentals in a way that corresponded to the extrapolative procedures implicit in stock market index prices. Investors perceived shifts in long-run rates of future growth, and these shifts were large enough to plausibly generate the major bull and bear markets of the twentieth century.

We cannot say ex ante that it was unreasonable or irrational to anticipate such shifts, for economies undergo large changes in long-run growth rates: for example, Argentina was 20 percent richer than Italy in 1950 and had grown faster than Italy for a century, yet Argentinian output per worker today is less than one-third of Italian; Japanese output per worker had remained roughly constant, relative to the U.S. level, at 30 percent from 1870 to 1930 (and as a result of World War II had fallen to 17 percent in 1950), yet is more than 90 percent today.

Barsky and I conclude that U.S. investors' long-run extrapolation of past dividend growth into the future was not prima facie unreasonable. However, this does not imply that the stock market always functioned properly. Shleifer and I investigate the stock market bubble of 1929 and find clear and convincing evidence of large-scale stock market irrationality.[19] We focus on the anomalous behavior of closed-end mutual funds, which are publicly traded companies that hold as their sole assets the shares of other companies. The "fundamental" value of a closed-end fund is thus easy to observe: if the stock market is efficient and setting prices equal to fundamentals, it is simply the market value of the firms that make up its portfolio. Since 1930 closed-end funds on average have sold at prices 20 percent lower than the fundamental value of their portfolios.[20]

In 1929, however, closed-end funds sold at significant premiums relative to their net asset values—premiums that increased as the speculative fever approached its peak in the late summer of 1929. We find a relative rise in the premium on the typical closed-end fund of more than 50 percent from January to August 1929, and a subsequent fall of equal proportional magnitude after the Great Crash of 1929. These large swings in the closed-end fund discount are clear evidence of large-scale stock market irrationality. The correlation of changes in the closed-end fund premium with movements in the general market leads us to estimate that irrational speculative enthusiasm had pushed the stock market approximately 45 percent above its rationally estimated fundamental value by late summer 1929.

In addition, some national stock markets have managed to avoid swings in market average price–dividend ratios associated with investors' extrapolation of past dividend growth into the future. Marco Becht and I study the German stock market, and find that marketwide price–dividend ratios were remarkably constant in the half century before World War I.[21] Indeed, the price–dividend ratio was so nearly constant that even the most powerful tests of the efficient markets hypothesis found in Shiller (1989) show no sign of "excess volatility."

Becht and I attribute the constancy of the pre–World War I price–dividend ratio in the German market to the presence in the market of the German *Großbanken*. These "Great Banks" were the largest corporations in pre–World War I Germany, and were at once commercial banks, investment banks, stockbrokers, and investment counselors. They placed their representatives on the boards of most industrial corporations, repeatedly extended loans that provided long-term capital for German industrial development, and appeared to exercise the dominant influence over the choice of top managers and executives, and over dividend and expansion policy on many corporate boards.[22]

One of the major sources of profit for the *Großbanken* was their investment banking business, through which they profited not just from the loans they made directly to companies in their "finance capitalist" empires but from these companies' raising of capital on securities markets as well. In order to realize a high price for the securities they helped issue, the *Großbanken* had to convince investors that it was prudent to hold financial securities. To that end, they sought to stabilize the market values of securities they had issued in the past so that they could assure investors that the securities they recommended were likely to remain stable in value in the future. As best we can judge, they appear to have succeeded: German stock index prices before World War I exhibit much less volatility than American prices did, and provide better forecasts of future profits and profitability.

[19] *J. B. De Long and A. Shleifer, "The Stock Market Bubble of 1929: Evidence from Closed-End Funds," NBER Working Paper No. 3523, December 1990, and* Journal of Economic History *52, 3 (September 1991), pp. 675–700, and "Closed-End Fund Discounts: A Yardstick of Small-Investor Sentiment,"* Journal of Portfolio Management *18, 2 (Winter 1992), pp. 46–53.*

[20] *In large part, Shleifer and I believe, because investors in closed-end funds know that they must face not only the fundamental risk that the portfolio might fall in value, but the extra risk that the market's valuation of closed-end funds relative to the value of their portfolios might decline.*

[21] *J. B. De Long and M. Becht, "Excess Volatility in the German Stock Market, 1876–1990," NBER Working Paper No. 4054, April 1992.*

[22] *They exercised so much influence that leading social democrat and future finance minister Rudolf Hilferding could write in 1910 that all that was needed to attain socialism was the nationalization of Germany's six largest banks. See R. Hilferding,* Das Finanzkapital: Eine Studie über die jüngste Entwicklung des Kapitalismus, *Vienna: Wiener Voksbuchhandlung, 1910.*

Differences in the behavior of the German and American stock markets after World War II are much smaller. The "Great Banks" no longer have as much influence and power as they once did. Nevertheless, there are some signs today that financial markets in which financial institutions exercise influence over operating companies and play important roles in investment banking and corporate governance do better at their task of channeling savings to firms that seek to invest and expand.[23]

Conclusion

The lines of research I have covered here sprawl across a number of subfields of economics—asset pricing, behavioral finance, corporate control, growth, macroeconomics, and economic history. Nevertheless, they have close links. Good financial market organization and performance are essential to guide the transformation of savers' wealth into firms' capital. A high rate of investment properly channeled into productive uses is a necessary prerequisite for rapid productivity growth.

The macroeconomic and historical studies of comparative cross-country growth show the critical importance for both developing and industrial economies of achieving a high rate of investment in machinery and equipment. A high rate of machinery investment is indispensable for industrialization, and for building up the skills and experience to productively use technologies at the world's best-practice frontier.

The studies of J. P. Morgan and Company at the turn of the century examine the role played by financial institutions in the financing of industrialization and mechanization at the key moment in history at which America became the leading industrial nation. By 1913 the highest productivity firms in the world were American, many of which had financed their expansion through the Morgan partnership. The central lesson is that financing firm expansion, especially in high technology industries with substantial capital requirements, is difficult. Financial intermediaries are essential to help channel the transformation of investors' savings into firms' capital goods.

The studies of asset pricing examine how effectively the securities markets provide firms and investors with estimates of future profitability. The U.S. stock market was prone to speculative enthusiasm in 1929. It appears to overextrapolate recent past growth into the future, but the task of forecasting is so difficult that such extrapolation appeared reasonable ex ante. The pre–World War I German market, by contrast, avoids giving any appearance of "excess volatility": its different institutional arrangements give powerful actors incentives to stabilize prices. The central lesson is that we have few grounds for confidence that America's present institutions are the financial institutions that best help the stock market fulfill its role as a social calculating mechanism for guiding the pace and direction of investment.

[23] *T. Hoshi, A. K. Kashyap, and D. S. Scharfstein, "Corporate Structure, Liquidity, and Investment: Evidence from Japanese Industrial Groups,"* Quarterly Journal of Economics *106, 1 (February 1991), pp. 33–60.*

Profiles

J. Bradford De Long

J. Bradford De Long joined the NBER in 1987 as a faculty research fellow in the Financial Markets and Monetary Economics program, and was an NBER Olin Fellow in 1991–2.

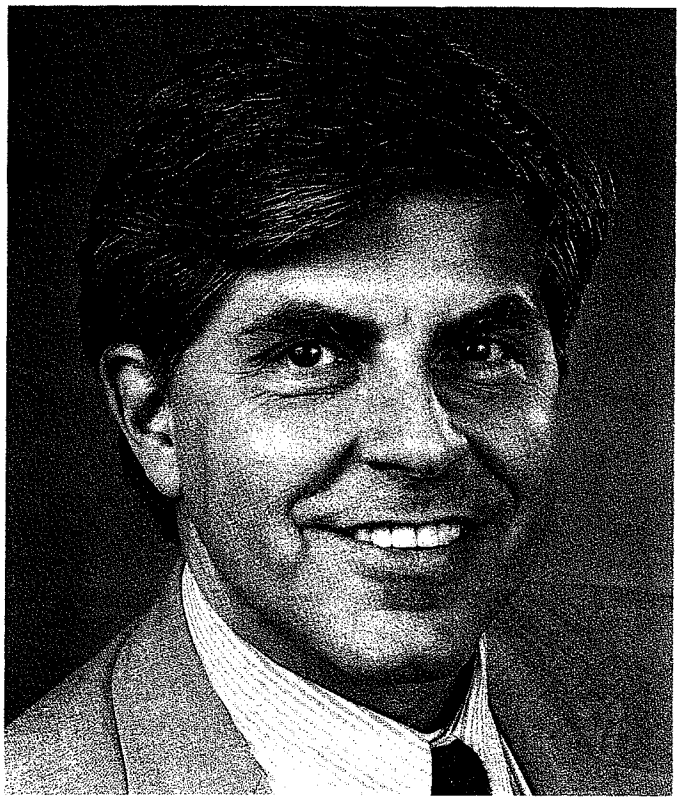
De Long received his bachelor's degree in social studies in 1982 and his Ph.D. in economics in 1987 from Harvard University. He was an assistant professor of economics at Boston University in 1987–8. In 1988, De Long became an assistant professor of economics at Harvard, and was promoted to associate professor in 1991. He is currently the Frederick S. Danziger Associate Professor of economics at Harvard.

De Long's research, which focuses on finance and on historical issues in economics, has appeared in several journals, including the *American Economic Review*, the *Journal of Economic History*, and the *Journal of Political Economy*.

His wife, Ann Marie Marciarille, is an attorney. Their son, Michael, is two years old and a frequent visitor to the Bureau's Cambridge office.

Andrew W. Postlewaite

Andrew W. Postlewaite, a professor of economics, finance, public policy, and management at the University of Pennsylvania, joined the NBER's Board of Directors in 1986 as that university's representative.



He received a B.A. in business administration and economics from Illinois Wesleyan University in 1965, an M.S. in mathematics from DePaul University in 1969, and a Ph.D. in applied mathematics from Northwestern University in 1973.

Postlewaite became an assistant professor in the Department of Economics of the University of Illinois in 1974, and was promoted to associate professor in 1976. He left there for the University of Pennsylvania, where he was a professor of public management from 1980–2. From 1982–7, and from 1991 to the present, he has served as chairman of the Economics Department at the University of Pennsylvania.

Postlewaite also has been a visiting professor at the University of California, San Diego; Princeton University; Stanford University; and at universities in France, Israel, Japan, Spain, and Thailand.

Postlewaite is an associate editor of the *Journal of Economic Theory* and the *Journal of Games and Economic Behavior*, and a fellow of the Econometric Society. His research has been published in a number of books and journals, including *Review of Economic Studies* and the *Journal of Political Economy*. He is married and has two children.

Harold T. Shapiro

Harold T. Shapiro, who joined the NBER's Board of Directors in 1986, has been president of Princeton University since 1988. Shapiro also holds a faculty appointment as a professor of economics and public affairs. He represents Princeton University on the Bureau's Board of Directors.

Shapiro received his bachelor's degree from McGill University in 1956 and his Ph.D. in economics from Princeton in 1964. That same year, Shapiro joined the University of Michigan faculty as an assistant professor of economics, was promoted to associate professor in 1967, and to full professor in 1970. He was named vice president for academic affairs in 1977, and served as president of the University of Michigan from 1980–7.

Shapiro is chief economic advisor for Junior Achievement, Inc., and serves on the board of directors of Dow Chemical Corporation. In January 1990, Shapiro was named to President Bush's newly established Council of Advisors on Science and Technology.

His wife, Vivian, currently is enrolled in the doctoral program at the Smith College School of social work. The Shapiros have four daughters and seven grandchildren.

Conferences

Seventh Annual Conference on Macroeconomics

Over 80 researchers gathered in Cambridge on March 6–7 for the NBER's Seventh Annual Conference on Macroeconomics. The program was organized by Olivier J. Blanchard and Stanley Fischer, NBER and MIT. Six papers were discussed:

Ben S. Bernanke, NBER and Princeton University, and Frederic S. Mishkin, NBER and Columbia University, "Guideposts and Signals in the Conduct of Monetary Policy: Lessons from Six Industrialized Countries" (NBER Working Paper No. 4082)

Discussants: Martin S. Eichenbaum, NBER and Northwestern University, and John B. Taylor, NBER and Stanford University

John H. Cochrane and Lars P. Hansen, NBER and University of Chicago, "Asset Pricing Lessons for Macroeconomics" (NBER Working Paper No. 4088)

Discussants: John Y. Campbell, NBER and Princeton University, and Philippe Weil, NBER and Harvard University

Steven J. Davis, NBER and University of Chicago, "International Trade and the Wage Structure"

Discussants: Richard B. Freeman, NBER and Harvard University, and Catherine Mann, Council of Economic Advisers

Alwyn Young, NBER and MIT, "A Tale of Two Cities: Factor Accumulation and Technical Change in Hong Kong and Singapore"

Discussants: Paul R. Krugman, NBER and MIT, and Robert J. Barro, NBER and Harvard University

Daniel Cohen, Centre D'Etudes Prospectives D'Economie Mathematique Appliques A La Planification, "The Debt Crisis: A Post Mortem"

Discussants: Jeremy I. Bulow, NBER and Stanford University, and Sule Özler, NBER and University of California, Los Angeles

Bernanke and Mishkin compare the conduct and performance of monetary policy in six industrialized countries—the United States, United Kingdom, Canada, Germany, Switzerland, and Japan—since the breakup of the Bretton Woods system. They observe that central banks adopt money growth targets when inflation threatens to get out of control. Money growth targets can be useful in providing a medium-term framework for monetary policy, if the targeting is done in a clear and straightforward manner. On the other hand, rigid adherence to money targets in the short run appears to be neither acceptable to central banks nor necessary for successful monetary policy.

Cochrane and Hansen explore the channels that link asset market data to macroeconomic models. They find that discount factors should be highly volatile, and either well correlated with, or even more volatile than, asset returns. Cochrane and Hansen also find that borrowing constraints loosen the required properties of aggregate measurements of intertemporal marginal rates of substitution, but sharpen the implications of asset market data for the marginal rates of substitution of unconstrained individuals.

Davis finds that several advanced industrialized economies experienced increases in overall wage inequality during the 1980s that were comparable to the U.S. increase. For example, since the 1970s the industrialized economies have shown large and persistent increases in the wages of prime age men relative to the wages of less experienced men. Also, following a period of declining education differentials in the 1970s, most industrialized economies had rising or flat education differentials in the 1980s. Further, the structure of relative wages in manufacturing after 1975 became increasingly dissimilar across the advanced economies.

Young finds that, while total factor productivity (TFP) growth in Hong Kong accounts for over one-third of output growth in the 1970s and 1980s, TFP growth in Singapore during the same period is next to nil. These results contradict models of growth that emphasize contemporaneous externalities in the accumulation of factors of production, and support models that emphasize the role of initial levels of human capital in expediting the subsequent acquisition of knowledge. The poor TFP performance of Singapore's economy, when compared with its astounding rate of structural transformation, also supports models that emphasize the constraints imposed by "learning by doing" on the evolution of comparative advantage.

Cohen calculates the returns on the developing countries' debt obtained by their private and public creditors, and shows that those returns are good. He then evaluates the conflict of interest between private and public creditors, and assesses the role of the Brady deal as a vehicle to bring a "grand settlement" of the debt crisis. Cohen shows that the group of reschedulers did suffer lower growth in the 1980s, but their rate of capital accumulation was not increased in the years before the debt crisis.

These papers and the discussions that followed them will be published by the MIT Press as *NBER Macroeconomics Annual: Volume 7, 1992*. Its availability will be announced in a future issue of the *NBER Reporter*.

Japan and the United States in Pacific Asia

As part of the NBER's broader study of economic factors affecting U.S. national security, 35 economists and political scientists from the United States, Canada, and Japan gathered on April 2–5 for an NBER conference on "Japan and the United States in Pacific Asia." Jeffrey A. Frankel, NBER and University of California, Berkeley, and Miles Kahler, University of California, San Diego, organized the following program:

Peter Petri, Brandeis University, "The East Asian Trading Bloc: An Analytical History"
Discussant: Stephan Haggard, Harvard University

Jeffrey A. Frankel, "Is Japan Creating a Yen Bloc in East Asia and the Pacific?" (NBER Working Paper No. 4050)
Discussant: Robert Z. Lawrence, NBER and Harvard University

Jeffry Frieden, University of California, Los Angeles, "Domestic Politics and Regional Cooperation: The United States, Japan, and Pacific Money and Finance"
Discussant: Takeo Hoshi, University of California, San Diego

Shafiqul Islam, Council on Foreign Relations, "Foreign Aid and Burden Sharing: Is Japan Free-Riding to a Co-Prosperity Sphere in Pacific Asia?"
Discussant: Stephen Krasner, Stanford University

Robert Dekle and Albert Ma, Boston University, "U.S.–Japan Burden Sharing of Defense and Foreign Aid"
Discussant: Takashi Inoguchi, University of Tokyo

Takatoshi Ito, NBER and Hitotsubashi University, "U.S. Political Pressure and Economic Liberalization in East Asia"
Discussant: Frances Rosenbluth, University of California, San Diego

Kenneth A. Froot, NBER and Harvard University, and David B. Yoffie, Harvard University, "Trading Blocs and the Incentives to Protect: Implications for Japan and East Asia"

Discussant: Marcus Noland, Institute for International Economics

Richard Doner, Emory University, "Japanese Foreign Investment and the Creation of a Pacific–Asian Region"
Discussant: Robert E. Lipsey, NBER and Queens College, City University of New York

Gary Saxonhouse, University of Michigan, "Operations of Japan's Multinational Corporations in Asia"
Discussant: Robert Gilpin, Princeton University

Peter Katzenstein and Martin Rouse, Cornell University, "Japan as a Regional Power: Influence and Response in Pacific Asia"
Discussant: Wing Woo, University of California, Davis

David Friedman, The RAND Corporation, and Richard Samuels, MIT, "How to Succeed Without Really Flying: The Japanese Aircraft Industry and Japan's Technology Ideology"
Discussant: Gregory Noble, University of California, Berkeley

Petri finds that East Asia's trade is more biased regionally than that of North America or Western Europe. The region's intrabloc bias steadily diminished until the mid-1980s, but has been rising since then. Its origins can be traced to historical "linkage investments" undertaken, for the most part, before World War II. However, a new wave of such investments is underway, and this may renew the intensification of regional trade.

Frankel notes that the *level* of trade in Pacific Asia, as within the European Community and within the Western Hemisphere, is biased intraregionally, to a greater extent than can be explained naturally by distance. However, there is no evidence of a special Japan effect. Once rapid growth in Asia is accounted for, there is no evidence of a *trend* toward intraregional bias of trade flows; only in Europe did intraregional trade bias increase in the 1980s. There is, however, some evidence of rising Japanese influence in the region's *financial markets*. Tokyo recently has acquired significant influence over interest rates in a few Asian countries, but its influence overall is no greater than New York's. Finally, some of Japan's financial and monetary influence takes place through a growing role for the yen at the expense of the dollar. Ths yen has become relatively more important in exchange rate policies and invoicing of trade and finance in the region. But this trend is less the outcome of Japanese policymakers' wishes than of pressure from the U.S. government to internationalize the yen.

Frieden observes that Pacific monetary and financial stability may depend on Japanese–American cooperation in regional money and finance. The two nations' policies in turn depend on domestic politics. Each country has "internationalist" groups, which favor cooperation in regional monetary and financial relations, and "nationalistic" groups, which give primacy to domestic goals. Despite continuing conflict, groups favorable to international economic cooperation appear to be gaining ground in Japan. Conversely, internationalist groups are slipping in influence in the United States, although they remain very influential.

Islam finds that there is little analytical foundation for viewing defense spending and foreign aid—American and Japanese—as international public goods. Further, Tokyo bureaucrats are not using aid incentives as instruments to create a regional economy, essentially to serve Japan's trade and investment interests. Market

forces are largely responsible for these increased regional linkages. Evidence from the Philippines and the Asian Development Bank supports these conclusions. Japan seems to be cooperating—financially and politically—with the United States. However, conflicts arise when Japan's attempts to assume greater responsibility collide with the American propensity to maintain its influence at the Asian Bank.

Dekle and Ma find that the United States and Japan are cooperating for defense spending. For foreign aid, though, there is no visible interaction in the spending by the two countries. This suggests that either foreign aid is viewed as a private good or that it represents different public goods for the United States and Japan.

Ito evaluates U.S. pressure for economic liberalization in Japan, and discusses the implications for economic and political aspects of the East Asian regional future. He asserts that the pressure from the United States will not turn Japan to the Asian countries for now. Japan still lacks a market to absorb Asian goods or an idea and principle to lead the Asian countries. However, if the European Community and North American Free Trade Agreement become a reality, the Asian bloc may be formed as a reaction to them.

Froot and Yoffie argue that the potential for foreign direct investment helps to discipline the level of protectionism that governments find optimal. However, if trading blocks are not both host for and home to foreign investment, then the forces that tend to reduce protectionist incentives may be weakened. In particular, if Japan remains reserved for the Japanese, then European and North American firms may lack (or believe that they lack) trade and investment access to a larger East Asian trading bloc. The rational response for some of these firms might be to prevent the creation of an even larger East Asian trading bloc by actively countering Japanese expansion in East Asia.

Doner defines Japanese foreign investment to include intermediate forms of activity, such as technology licensing, as well as direct investment. He argues that Japanese investment has promoted a dynamic division of labor in Northeast and Southeast Asia. Japanese investment also has encouraged the growth of Japanese-like institutions in the region. The impact of Japanese investment varies over time and across countries, and understanding this variation requires attention not only to factor endowments, but also to politics and institutions. Doner concludes that if U.S. firms are to maintain and expand their presence, they must adapt to and take advantage of the institutions and business practices emerging in the region as a result of Japan's investment.

Why is there an upsurge of interest in regionalism in East Asia? Saxonhouse suggests that, even without violating existing GATT provisions, trading blocs formed elsewhere can lower East Asian welfare. These blocs may have no incentive to expand their membership to include East Asian economies, except for fear of provoking the formation of an East Asian trading bloc. However, there is little evidence of such a bloc at present. The pricing strategies of East Asian firms do suggest, though, that despite substantial progress in trade liberalization, regionwide liberalization still could be of considerable benefit.

Katzenstein and Rouse argue that Japan's future role in the international system will be affected deeply by a political regionalism in Asia that will supplement, rather than replace, the U.S.–Japan relationship. Drawing from the experiences of Thailand and Indonesia, where issues of regionalism have gained salience in the 1980s, the authors suggest that regionalism will be constructed around bargains embedded in a set of multilateral regional and global arrangements that include the United States.

Since the end of World War II, the United States has spent billions of dollars more than Japan on military research and development, yet Japanese commercial manufacturing firms have developed capabilities that match or exceed American firms in many areas. This is possible in part because Japanese and U.S. technology and security ideologies diverge sharply. Friedman and Samuels first describe the three major elements of the Japanese technology and security ideology—indigenization, diffusion, and nurturance—and then illustrate the industrial consequences with a case study of aircraft, a sector that has been devoted overwhelmingly to military production in both nations since its origins in the early twentieth century. The authors conclude that: 1) Japan has embraced and promulgated a vision of national security that elevates local control, national learning, and sustained development over the cost, performance, and delivery schedules that dominate in America; 2) despite common perceptions to the contrary, the Japanese aircraft industry has "succeeded without really flying"; and 3) since differences in technology ideologies can lead to political and economic conflict, America faces significant conceptual and policy challenges in the near future if it is to maintain its military and commercial technological dynamism.

Also attending the conference were: Geoffrey Carliner, NBER; Dennis Encarnation, Harvard University; Martin Feldstein, NBER and Harvard University; Lawrence Krause, University of California, San Diego; Matthew Miller, *San Diego Union–Tribune*; and Shang-Jin Wei, University of California, Berkeley. A conference volume of the proceedings is planned by the University of Chicago Press. Availability of the volume will be announced in a future issue of the *NBER Reporter.*

Conference on Economic Growth

On April 3–4, the NBER held its fifth conference on economic growth. NBER Research Associates Robert J. Barro, Harvard University, and Paul M. Romer, University of California, Berkeley, organized this program:

Andrei Shleifer, NBER and Harvard University, and Robert W. Vishny, NBER and University of Chicago, "Corruption and Economic Growth"
Discussant: Martin Weitzman, Harvard University

Michael Kremer, Harvard University, "Population Growth and Technological Change: One Million B.C. to 1990"
Discussant: Paul M. Romer

Roland Bénabou, NBER and MIT, "Workings of a City: Location, Education, and Production" (NBER Technical Working Paper No. 113)
Discussant: Kiminori Matsuyama, Stanford University

Alwyn Young, NBER and MIT, "Substitution and Complementarity in Endogenous Innovation"
Discussant: Elhanan Helpman, NBER and Harvard University

Robert J. Barro; N. Gregory Mankiw, NBER and Harvard University; and Xavier Sala-i-Martin, NBER and Yale University, "Capital Mobility in Neoclassical Models of Growth"
Discussant: Robert G. King, NBER and University of Rochester

Rebecca Henderson, NBER and MIT; Adam Jaffe, NBER and Harvard University; and Manuel Trajtenberg, NBER and Tel Aviv University, "Geographic Localizations of Knowledge Spillovers as Evidenced by Patent Citations" (NBER Working Paper No. 3993)
Discussant: Ricardo J. Caballero, NBER and Columbia University

Olivier J. Blanchard, NBER and MIT, and Lawrence F. Katz, NBER and Harvard University, "Regional Evolutions"
Discussant: Sherwin Rosen, NBER and University of Chicago

J. Vernon Henderson, NBER and Brown University, and Ari Kuncoro and Matt Turner, Brown University, "Industrial Development in Cities"
Discussant: Edward L. Glaeser, University of Chicago

Shleifer and Vishny discuss three important types of corruption—monopolist bribetakers, multiple overlapping bribetakers, and competition in bribes—which have very different implications for a country's level of corruption and economic activity. Economies with weak governments and the resulting multiple overlapping bribetakers, especially those in Africa, suffer the most. The authors discuss how corruption differs from taxation and why it has pernicious effects on innovation and growth.

Kremer develops an integrated model of world population growth and technological change from prehistory to the present. In his model, research productivity per capita is independent of population, and the growth rate of technology is proportional to population. He predicts that the growth rate of world population will be approximately proportional to its level over the historical period in which technology limits population. Income gradually rises until a turning point is reached, after which population growth declines. This suggests that pronatal policies, at least in rich countries, may increase welfare and the long-run world growth rate of income per capita.

Bénabou examines the implications of local externalities in human capital investment for the size and composition of the productive labor force. In a city composed of several communities, peer effects will induce self-segregation by occupation, even though efficiency may require that communities be identical. Equilibrium segregation can cause entire "ghettos" to drop out of the labor force. The easier it is for high-skill workers to isolate themselves, the more unemployment there is. When perfect segregation is feasible, it can lead to a collapse of the productive sector.

Young proposes that inventions could as easily be complements as substitutes. He finds that there are two positive-growth steady states: in one, substitution between inventions dominates over the product life cycle; in another, complementarity dominates. In addition to the steady states, there are a variety of dynamic paths induced by expectations. Young finds that these paths diverge from the substitution-dominated steady state and converge to the complementarity-dominated steady state. However, with more general preferences, both steady states may be stable; that is, starting from an arbitrary initial rate of innovation, the economy may converge to either of the steady states.

Barro, Mankiw, and Sala-i-Martin observe that economies grow faster per capita if they start further away from their steady-state positions. For a homogeneous group of economies—such as the U.S. states, regions of western European countries, and the OECD countries—the convergence is absolute, in that the poor places grow faster than the rich ones do. The authors also show that the open-economy growth model conforms with the empirical evidence on growth if an economy can finance only a portion of its capital—even 50 percent or more of the total—with foreign debt.

Rebecca Henderson, Jaffe, and Trajtenberg compare the locations of patent citations and cited patents in order to determine how geographically localized knowledge spillovers are. They find that citations to U.S. patents are more likely to come from the United States, and to come from the same state and locality as the cited

patents, than would be expected based only on the pre-existing concentration of related research activity.

Blanchard and Katz examine the general features of regional booms and slumps using data on U.S. states for the last 40 years. Over the postwar period, some U.S. states have grown consistently faster, and others slower, than the national average. State booms and slumps are best described as transitory accelerations or slowdowns of employment growth. Growth eventually returns to normal, but the path of employment is affected permanently. These transitory changes in growth lead to transitory fluctuations in relative unemployment and wages. The authors find that the dominant adjustment mechanism to shocks to state economic activity is labor mobility, rather than job creation or migration. Labor mobility, in turn, appears to be primarily a response to changes in unemployment, rather than to movements in consumption wages.

What determines the location across cities of the machinery, electrical machinery, primary metals, computer, and electronic components industries? J. Vernon Henderson, Kuncoro, and Turner examine the role of historical factors, as well as current economic conditions, comparing 1970 with 1987. They find that industry concentration in the past is a critical determinant of current location and employment levels. There are regional shifts in employment, and certain critical factors determine where high tech industries locate.

Also attending the conference were NBER associates Alberto Alesina, Harvard University; Steven N. Durlauf, Stanford University; Larry E. Jones, Northwestern University; Boyan Jovanovic, New York University; Edward E. Leamer, University of California, Los Angeles; Torsten Persson, University of Stockholm; and James E. Rauch, University of California, San Diego. Other participants included Whitney Blake, John Wiley & Sons; Alan Heston, University of Pennsylvania; Jong-Wha Lee, Harvard University; Robert F. Lucas, University of Saskatchewan; Glenn MacDonald, University of Rochester; Casey B. Mulligan, University of Chicago; Daniel A. Nuxoll, Virginia Polytechnic Institute; and Lant Pritchett, World Bank.

The Labor Market in International Perspective

The most recent NBER-sponsored Universities Research Conference, on "The Labor Market in International Perspective," was organized by NBER Research Associates Francine D. Blau, University of Illinois, Urbana–Champaign, and Charles C. Brown, University of Michigan. The papers presented were:

Lawrence F. Katz, NBER and Harvard University, and Gary Loveman, Harvard University, "An International Comparison of Changes in the Structures of Wages: France, the United Kingdom, and the United States"

Discussants: David G. Blanchflower, NBER and Dartmouth College, and Per-Anders Edin, University of Uppsala

Jeff Borland, University of Melbourne, "Wage Inequality in Australia"

Discussants: Kevin M. Murphy, NBER and University of Chicago, and Francis Vella, Rice University

Dae-Il Kim, University of Chicago, and Robert H. Topel, NBER and University of Chicago, "Labor Markets and Economic Growth: Lessons from Korea's Industrialization, 1970–90"

Discussants: Anne Case, NBER and Harvard University, and William T. Dickens, NBER and University of California, Berkeley

Richard Chaykowski, Queen's University, and Janet Currie, NBER and MIT, "Sex Segregation on the Job and the Structure of Fringe Benefits"

Discussants: Richard B. Freeman, NBER and Harvard University, and Kathryn Shaw, Carnegie–Mellon University

Jonathan S. Leonard, NBER and University of California, Berkeley, and Marc van Audenrode, University of Quebec, Montreal, "Corporatism Run Amok: Job Stability and Industrial Policy in Belgium and the United States"

Discussants: Daniel S. Hamermesh, NBER and University of Michigan, and Kevin Lang, NBER and Boston University

Fumio Ohtake, Osaka University, and Joseph Tracy, Yale University, "Wage Bargaining in the United States and Japan"

Discussants: Thomas Kneiser, Indiana University, and David Weinstein, Harvard University

Eli Berman, Harvard University, and Eran Yashiv, New York University, "Unemployment, Vacancies, and Matching in the Israel Economy"

Discussants: Katharine G. Abraham, NBER and University of Maryland, and Gary Solon, University of Michigan

Lutz Bellmann, Institute for Employment Research, and Saul Estrin, Hartmut Lehmann, and Jonathan Wadsworth, London School of Economics, "Gross Flows in a Labor Market in Transition: Panel Data Estimates from Eastern Germany"

Discussants: Ronald G. Ehrenberg, NBER and Cornell University, and Stephen Jones, McMaster University

Alan S. Blinder and Alan B. Krueger, NBER and Princeton University, "International Differences in

Labor Turnover: A Comparative Study with Emphasis on the United States and Japan"

Discussants: Kenneth McLaughlin, University of Rochester, and Gary Saxonhouse, University of Michigan

Katz and Loveman compare changes in the wage structure in France, Great Britain, and the United States during the 1970s and 1980s. In all three countries, wage differentials by education and occupation (skill differentials) narrowed substantially in the 1970s. In Great Britain and the United States, overall wage inequality and skill differentials expanded dramatically during the 1980s. Also in the 1980s, sharp increases in the national minimum wage prevented the wage structure from expanding in France. Wage inequality therefore grew less in France, but unemployment among the young persisted at higher levels than in the other two countries. In all three countries, industrial and occupational shifts throughout the last 20 years favored the more educated.

Borland shows that, for full-time male employees in Australia, real wages declined appreciably in 1968–90, and there was an increase in wage inequality in the 1980s. The main causes of the change in wage inequality appear to be widening wage differentials across education and experience groups, and an increase in inequality within experience–education subgroups. While it seems that changes in education and experience differentials might be explained partially by movements in labor supply and demand, the pattern of change remains puzzling. Borland also shows that changes in experience and education wage differentials in Australia differed from the changes that occurred in the United States in the 1980s.

Kim and Topel analyze labor market performance in Korea between 1970 and 1990. Driven mainly by rapid productivity growth in tradable goods, the demand for industrial labor increased dramatically and real wages tripled. The share of agriculture in total Korean employment fell by 30 percent in less than 20 years. But the growth of manufacturing employment was accomplished solely by hiring new entrants to the labor force. Kim and Topel estimate that wages now are distributed more equally in Korea than in the United States. They suggest that rapid growth of education caused a convergence of schooling levels, which had both direct and indirect effects on inequality. The labor force share of unskilled workers fell, and their relative price rose. Growth of demand in certain industries raised aggregate wages, while relative wages changed because of shifting relative supplies.

Using data from Ontario, Chaykowski and Currie show that workers in predominantly female bargaining units have more generous leave provisions, but are less likely to have pension coverage, than workers in similar predominantly male bargaining units. They suggest that, for women, lack of pension coverage is associated with marriage and childbearing. Chaykowski and Currie also ask to what extent labor market discrimination is responsible for differences in coverage, or whether they arise because women bear the chief responsibility for household production and tend to hold jobs that are compatible with that role.

Leonard and van Audenrode argue that high and persistent unemployment in Europe is explained by the negative interaction of a number of distinct and overlooked policies. Industrial policy taxes growing firms to subsidize failing firms. This helps to account for the lower rates of both job creation and destruction in Europe, and for the lower rate of employment growth. Minimum wages, unemployment benefits, and a centralized bargaining system whose wage outcomes are extended by law to all private employers limits the growth of low-wage employers, and results in unemployment.

Ohtake and Tracy ask why labor negotiations in Japan produce few strikes. They find that, in both the United States and Japan, strike activity is procyclical with respect to the aggregate unemployment rate. But in Japan, macroeconomic uncertainty, rather than industry-specific uncertainty, is an important reason for protracted negotiations. This suggests that the Japanese Joint Consultation System plays an important role.

Berman and Yashiv study the evolution of unemployment and vacancies in Israel over the last two decades. They find that, in all periods, vacancies are more important than unemployment in the determination of new hires. Most of the variation in unemployment from 1964–79 was caused by variations in aggregate activity. But high levels of unemployment during the 1980s cannot be explained by decreases in aggregate demand. During the 1980s, the authors suggest, major changes in the unemployment rate may have been the result of shifts in government hiring policy.

Bellmann, Estrin, Lehmann, and Wadsworth investigate the behavior of the East German labor market during the initial stages of the transition to a market economy. They use information contained in a unique longitudinal survey of German Democratic Republic residents taken between November 1990 and November 1991. They find that the sharp increase in the stock of unemployment was caused mainly by large inflows from employment. However, flows out of unemployment have risen steadily throughout the sample period. Interindustry flows also have increased, primarily into the emerging finance and service sectors. As in western economies, it seems that older workers are most at risk of loss or employment and exit from the labor force. Also, newly privatized firms are shedding male workers faster than other firms are.

Blinder and Krueger analyze the high rate of labor turnover in the United States compared to Japan and other developed countries. Detailed interviews of American and Japanese multinational firms in both the United States and Japan, and an analysis of labor turnover

among Japanese–Americans, suggest that both management and labor culture contribute to the low turnover rate in Japan. The authors conclude that Japanese firms invest heavily in human resources and make a variety of efforts to reduce labor turnover. In contrast, American firms invest less heavily in human resources, and structure work in ways that minimize the cost of high labor turnover. The low-turnover, high-investment strategy may lead to a competitive advantage in certain industries, they conclude.

Nearly 90 researchers from 50 colleges and universities participated in this conference.

Workshop on Macroeconomic History

Nearly 40 economists gathered in Cambridge on April 24 to take part in an NBER "Workshop on Macroeconomic History" organized by N. Gregory Mankiw, NBER and Harvard University, and Christina D. Romer, NBER and University of California, Berkeley. Six papers were discussed:

François R. Velde, Stanford University, and Thomas J. Sargent, NBER and Hoover Institution, "The Macroeconomic Causes and Consequences of the French Revolution"

Discussant: Eugene N. White, NBER and Rutgers University

David M. Cutler, NBER and Harvard University, "Government Spending and Real Interest Rates: The World War II Experience"

Discussant: Herschel I. Grossman, NBER and Brown University

J. Bradford De Long, NBER and Harvard University, and Barry J. Eichengreen, NBER and University of California, Berkeley, "The Marshall Plan: History's Most Successful Structural Adjustment Program" (NBER Working Paper No. 3899)

Discussant: Robert J. Gordon, NBER and Northwestern University

Christina D. Romer, "Remeasuring Business Cycles: A Critique of the Prewar NBER Reference Dates"

Discussant: Victor Zarnowitz, NBER and University of Chicago

Anil K. Kashyap, NBER and University of Chicago, and David W. Wilcox, Board of Governors of the Federal Reserve System, "Production and Inventory Control at the General Motors Corporation During the 1920s and 1930s"

Discussant: Daniel Raff, NBER and Harvard University

Russell Cooper, NBER and Boston University, and John Haltiwanger, University of Maryland, "Autos and the National Industry Recovery Act: Evidence on Macroeconomic Complementarities"

Discussant: Olivier J. Blanchard, NBER and MIT

Velde and Sargent bring modern macroeconomic theory to bear on the monetary and fiscal affairs of the French Revolution. They argue that persistent institutional constraints on the French government's fiscal policy ultimately set off the Revolution in 1789. The new government inherited a large debt problem and, in the process of solving it, created a new monetary instrument, the *assignat*. First implemented as a form of commodity money, the *assignat* later was used as fiat currency for war financing, and ultimately was driven out in a hyperinflation.

Real interest rates fell with the unexpected entry of the United States into World War II and rose with the unexpected conclusion of the war. Cutler notes that these facts are not consistent with traditional analyses of transitory changes in fiscal policy. The movements in real interest rates do not appear to be the result of changes in risk or expectations of tax policy, nor to be caused by changes in the desired composition of assets. They may reflect the monetary and regulatory policies of the war.

De Long and Eichengreen examine the economic effects of the Marshall Plan: the program that transferred some $13 billion to Europe in 1948–51. They find that it was not large enough to have significantly accelerated recovery by financing investment, aiding the reconstruction of damaged infrastructure, or easing commodity bottlenecks. They argue, however, that by influencing government policy, the Marshall Plan did play a major role in setting the stage for the rapid growth in post–World War II Western Europe. The conditions attached to Marshall Plan aid pushed the post–World War II "mixed economies" in Europe to have more "market" and less "controls" in the mix.

Romer analyzes the consistency of the NBER business cycle reference dates over time. She matches the postwar peaks and troughs closely to derive consistent cycle dates for 1884 to 1940. The new dates systematically place peaks later and troughs earlier than the NBER dates do. These consistent dates show no difference in the average duration of contractions between the prewar and postwar eras; the NBER dates, in contrast, show shorter contractions after World War II.

Kashyap and Wilcox analyze the design and implementation of a production control system at General Motors during the 1920s and 1930s. They find that GM tried to maintain a targeted level of inventory relative to expected sales, and, secondarily, to smooth production. The production control program was more successful before 1932 than after.

After documenting key features of the automobile industry during the 1920s and 1930s, Cooper and Haltiwanger analyze two models of the annual automobile

cycle to explain observed changes in production and sales. They discredit the hypothesis that changes in fundamentals led to observed changes in the seasonal pattern of production and sales after 1935.

Other participants in the workshop were NBER associates Michael D. Bordo, Rutgers University; Geoffrey Carliner; Stephen G. Cecchetti, Ohio State University; Rudiger Dornbusch and Peter Temin, MIT; Benjamin M. Friedman, Harvard University; Jeffrey A. Miron, Boston University; and Frederic S. Mishkin, Columbia University. Also attending were Martin Evans, New York University; Alexander Field, Santa Clara University; Christopher Hanes, University of Pennsylvania; John James, University of Virginia; Adam Klug, Princeton University; Martha Olney, University of Massachusetts, Amherst; Stephan Oppers and Boris Simkovich, Harvard University, Warren Weber, Federal Reserve Bank of Minneapolis; and David N. Weil, Brown University.

Economics of Higher Education

On April 30, the NBER held a conference on the "Economics of Higher Education" in Cambridge. Organized by Charles T. Clotfelter, NBER and Duke University, and Michael Rothschild, NBER and University of California, San Diego, the program was:

Thomas J. Kane, NBER and Harvard University, and Cecilia Elena Rouse, Harvard University, "Labor Market Returns to Community College"
Discussant: Charles F. Manski, NBER and University of Wisconsin, Madison

Albert Rees, Princeton University, "The Salaries of Ph.D.'s in Academe and Elsewhere"
Discussant: Sherwin Rosen, NBER and University of Chicago

Ronald G. Ehrenberg, NBER and Cornell University, and Panagiotis G. Mavros, Cornell University, "Do Doctoral Students' Financial Support Patterns Affect Their Times-to-Degree and Completion Probabilities?" (NBER Working Paper No. 4070)
Discussant: Debra Barbezat, Amherst College

Sharon B. Levin, University of Missouri, St. Louis, and Paula E. Stephan, Georgia State University, "The Financial Rewards to Academic Research: Inducement to Mediocrity?"
Discussant: David A. Wise, NBER and Harvard University

Stephen Cameron, University of Chicago, and James J. Heckman, NBER and University of Chicago, "The Dynamics of Educational Attainment for Blacks, Whites, and Hispanics"
Discussant: Michael J. Moore, Duke University

Michael Rothschild, and Lawrence J. White, New York University, "Some Simple Economics of Higher Education"
Discussant: Jerry R. Green, NBER and Harvard University

Philip J. Cook, Duke University, and Michael J. Moore, "Drinking and Schooling"
Discussant: Zvi Griliches, NBER and Harvard University

Jere R. Behrman, Brown University; Lori G. Kletzer and Michael S. McPherson, Williams College; and Morton Owen Schapiro, University of Southern California, "The College Investment Decision: Direct and Indirect Effects of Family Background on Choice of Postsecondary Enrollment and Quality"
Discussant: Richard Murnane, Harvard University

Using the National Longitudinal Study of the High School Class of 1972, Kane and Rouse find that men who attend two-year colleges earn about 8 percent more than high school graduates, but no measurable additional gain comes from earning an associate degree. Women who attend a two-year college earn 9 percent more than high school graduates, and gain even more by finishing an associate degree. In fact, women with an associate degree earn 20 percent more than high school graduates, and almost as much as those with bachelor degrees.

Ph.D.'s employed by colleges and universities are paid 10 to 20 percent less than those in government or industry. Rees's paper examines salary data for Ph.D.'s who moved between the two sectors from 1985–7 and for those who did not. He finds that Ph.D.'s who moved to the academic sector got smaller average salary increases than those who did not move; Ph.D.'s who moved to the nonacademic sector got larger increases than those who stayed. Because the quality of the employees was held constant, quality differences do not explain the pay differences between sectors. Thus, pay differences must reflect the nonpecuniary benefits of academic employment, including autonomy and job security.

Ehrenberg and Mavros use data on all graduate students who entered Ph.D. programs in four fields during a 25-year period at a single major doctorate-producing university, to estimate how financial support of graduate students influences their degree completion. They find that, other things held constant (including measured student ability), students who receive fellowships or research assistantships have higher completion rates and shorter times-to-degree than students who receive teaching assistantships or tuition waivers, or students who are totally self-supporting. The impact of financial support patterns on the fraction of students who complete programs is much larger than its impact on mean times-to-degree, or on the possibility of dropping out.

Levin and Stephan investigate whether the academic reward structure encourages "paper inflation" by ignor-

ing quality of work and/or number of coauthors. They estimate changes in salary using data from the Survey of Doctorate Recipients and the Science Citation Index for four fields of science. They find that, particularly in physics and biochemistry, the reward structure does encourage paper inflation. In the fields of earth science and physiology, though, departments act to discourage "line counts."

Cameron and Heckman find that, for all demographic groups, choices regarding schooling are sensitive to tuition, alternative opportunities, and family background. Also, students appear to look ahead. When college tuition costs rise, high school drop-out rates also rise. Finally, while socioeconomic variables explain the schooling choices of each demographic group, they explain very little of the differences among groups.

Rothschild and White observe that colleges produce human capital (increases in the earnings of their students) using both students and other resources as inputs. With an optimal tuition structure, students would be charged the amount by which education increased their human capital, minus the "wage" they would earn as inputs in the production of human capital (theirs and their fellow students'). Under constant returns to scale, such a tuition structure is competitive. At the optimal tuition structure, different students will pay different amounts to attend a single college. Identical students will pay identical tuition at the same college and different amounts at different colleges.

Cook and Moore find that youthful drinking affects educational attainment. Students of given ability and family circumstances who report heavy drinking in high school are less likely than their peers to matriculate in college and to graduate with a four-year degree. Further, those who intend to pursue a four-year college degree are less likely than their peers to drink heavily. Finally, Cook and Moore find that both the beer tax and the minimum legal purchase age have a statistically significant and quite important effect on the likelihood of eventual graduation with a four-year degree. It appears that youths whose adolescence is spent in states with relatively restrictive alcohol policies tend to go further in school than otherwise similar youths in other states.

Behrman, Kletzer, McPherson, and Schapiro show that students from families with high income, better educated parents, or parents with higher socioeconomic status generally do better on tests of scholastic achievement. Scholastic achievement is related positively to attending a four-year postsecondary school, but not to attending a two-year school. They find similar influences of family background directly on postsecondary enrollment and quality.

Also participating were: Geoffrey Carliner and Martin Feldstein, NBER; Karl Case, Wellesley College; Martin Cave, Brunel University; Per-Anders Edin, University of Uppsala; Robert Jacobson, *The Chronicle of Higher Education*; and Nada Eissa, Harvard University.

The Economics of Aging

The NBER held another in a series of conferences on the "Economics of Aging" on May 7–10. David A. Wise, director of the NBER's Aging Project, also of Harvard University, organized this program:

Kenneth Manton and Eric Stallard, Duke University, and Burton Singer, Yale University, "Projecting the Future Size and Health State of the U.S. Elderly"

James W. Vaupel, Duke University, "Uncertainties and New Evidence About the Prospects for Longer Life Expectancy"

Discussants: Peter A. Diamond, NBER and MIT, and Michael D. Hurd, NBER and SUNY, Stony Brook

Edward P. Lazear, NBER and University of Chicago, "Some Thoughts on Saving"

James M. Poterba, NBER and MIT; Steven F. Venti, NBER and Dartmouth College; and David A. Wise, "401(k) Plans and Tax-Deferred Saving"

Discussants: B. Douglas Bernheim, NBER and Princeton University, and Jonathan S. Skinner, NBER and University of Virginia

Robin L. Lumsdaine, NBER and Princeton University, James H. Stock, NBER and Harvard University, and David A. Wise, "Pension Plan Provisions and Retirement: Men and Women, Medicare, and Models"

Fizza S. Gillani, Boston University, and Laurence J. Kotlikoff, NBER and Boston University, "Retirement Modeled Jointly with Saving: The Experience in a Large Corporation"

Discussants: John P. Rust, NBER and University of Wisconsin, and James Smith, Rand Corporation

John B. Shoven, NBER and Stanford University; Michael Topper, College of William and Mary, and David A. Wise, "The Impact of the Demographic Transition on Government Spending"

Discussant: Michael D. Hurd

Daniel L. McFadden, NBER and University of California, Berkeley, "Demographics, the Housing Market, and the Welfare of the Elderly"

Axel H. Börsch-Supan, NBER and University of Mannheim, "Aging in Germany and the United States: International Comparisons"

Discussant: N. Gregory Mankiw, NBER and Harvard University

David M. Cutler, NBER and Harvard University, and Louise M. Sheiner, Joint Committee on Taxation, "Policy Options for Long-Term Care"

Andrew Dick, Stanford University, and Alan M. Garber and Thomas E. MaCurdy, NBER and Stanford University, "Forecasting Nursing Home Utilization of Elderly Americans" (NBER Working Paper No. 4107)

Discussant: Jonathan Feinstein, NBER and Stanford University

Angus S. Deaton, NBER and Princeton University, and Christina H. Paxson, Princeton University, "Saving, Growth, and Aging in Taiwan"
Discussant: Jonathan S. Skinner

Manton, Stallard, and Singer simulate health changes by assessing the effects of health interventions and random events. By increasing the amount of information on health and mortality in their projections, they find that they can better anticipate both the state of health at extreme ages and the changes in health over time.

Vaupel's research suggests that there is no genetic barrier to an increase in life expectancy to 100 years. If current rates of progress in reducing mortality at advanced ages continue or accelerate, then children alive today may live 90 or even 100 years on average.

Lazear observes that there are a number of reasons why the United States may suffer from undersaving. But the differences between U.S. and Japanese saving rates, for example, may be a consequence of different tastes for saving versus current spending. If that is so, then the rationale for government intervention to raise U.S. saving rates is weak.

Poterba, Venti, and Wise observe that more than 15 million workers now participate in 401(k) plans. Since 1986, only one-fifth of 401(k) contributors also have made IRA contributions. But the authors find no evidence that households making 401(k) contributions accumulate other assets more slowly than households without 401(k)s.

Lumsdaine, Stock, and Wise confirm that in the firm pension plan they study, changes in retirement rates by age correspond closely to plan provisions. Further, there is essentially no difference in the retirement behavior of men and women.

Using work-history data from one of the largest U.S. corporations, Gillani and Kotlikoff find that workers' retirement decisions are very sensitive to the incentives in "window plans"—that is, special inducements to retire provided for limited periods of time. Workers' retirement decisions also depend on the initial level of their assets. Thus, it is important to study saving and retirement jointly.

Shoven, Topper, and Wise ask how the aging of the U.S. population over the next 50 years will affect total (federal, state, and local) government spending. They project that, maintaining the 1986 pattern of transfer payments by age and family size, the cost of 21 major government programs will rise from $669 billion in 1990 to $1106 billion in 2040. Social Security, Medicare, and Medicaid together represent $343 billion of that $437 billion increase. The authors estimate that average taxes per capita will have to rise by about 10 percent to fund this increased spending.

McFadden calculates the welfare effects of volatility in the price of housing. He finds that groups of people born from 1950 on are not likely to enjoy the large gains in housing wealth of earlier generations. They are slightly worse off than those born in 1920–40, and substantially worse off than those born before 1920.

Börsch-Supan compares how the German and U.S. economies are affected by the aging of their populations. He focuses on institutional arrangements, such as government regulations and subsidies for retirement, savings, and housing in the two countries. He notes that Germany's dependency ratio (the ratio of retirees to workers) is already as large as it will be in 2015 in the United States; it is predicted to exceed 43 percent at its peak in 2030. In this respect, changes that are occurring in Germany now may be indicative of changes to come in the United States.

Cutler and Sheiner find that the number of available beds per elderly person is the primary determinant of nursing home utilization in the aggregate. Other state policies, including the price differential between Medicaid and private payers, also affect who goes to a nursing home. Still, about two-thirds of the elderly in nursing homes would have lived with their children or others had they resided in the same community. Finally, as acquiring Medicaid becomes easier, or as Medicaid payments become more generous, fewer elderly receive substantial day-to-day help from their children, the authors find.

Dick, Garber, and MaCurdy estimate that there is a 35 percent risk that a 65-year-old will enter a nursing home at some point in time. Most nursing home admissions are brief: the median utilization for those admitted to nursing homes is only six months. However, the modest but nonnegligible risk of institutionalization lasting for years, or of subsequent readmission, indicates that there may be an important role for insurance for catastrophic nursing home expenditures.

Deaton and Paxson study household saving, growth, and aging in Taiwan. The Taiwanese patterns of high income growth, declines in fertility, and increases in life expectancy all have implications for the theory of life-cycle savings. Using data for 1976–90, the authors find that the patterns of consumption and saving across households of different ages and cohorts are broadly consistent with a life-cycle model. However, the data also indicate that household consumption closely tracks income, casting doubt on simple life-cycle theory.

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

Fifth Annual Interamerican Seminar on Economics

The Fifth Annual Interamerican Seminar on Economics was held this spring in Buenos Aires. The Instituto Torcuato di Tella of Buenos Aires joined the NBER and the Pontifica Universidade Católica (PUC), Rio De

/Janeiro, as sponsors of the meeting. The agenda, planned by Edmar Bacha, PUC; Alfredo Canavese, Instituto Torcuato di Tella; Sebastian Edwards, NBER and University of California, Los Angeles; and Daniel Heymann, CEPAL, was:

Marco Antonio Bonomo, PUC, and Rene Garcia, Université de Montréal, "Credible Disinflations and Indexation"

Discussants: Diego Petrecolla, Universidad Torcuato de Tella, and Luis Viana, Centro dl Ricerche e Sociali

Guillermo Calvo and Carlos Vegh, International Monetary Fund (IMF), "Stabilization Dynamics and Backward-Looking Contracts"

Discussants: Rudiger Dornbusch, NBER and MIT, and Carlos Rodriguez, CEMA

Daniel Heymann, and Pablo Sanguinetti, Instituto Torcuato di Tella, "Fiscal Inconsistencies in High Inflation"

Discussant: Felipe Larrain, PUC, Santiago

Albert Fishlow, University of California, Berkeley, and Jorge Friedman, ILADES/Georgetown, "Tax Evasion and Financial Repression: Some Latin American Evidence"

Discussants: Eliana A. Cardoso, NBER and Tufts University, and Miguel Kiguel, World Bank

Tamim Bayoumi, IMF, and Barry J. Eichengreen, NBER and University of California, Berkeley, "Exchange Rate and Monetary Arrangements for the North American Free Trade Area"

Discussants: Ana Maria Martirena-Mantel and Javier Villanueva, Instituto Torcuato di Tella

Omar O. Chisari, CEDES, and Fernando Navajas, CEPAL, "Public Inputs, Tax Collection Costs, and Fiscal Constraints"

Discussants: Victor Elias, Universidad Nacional de Tucuman, and Rolf Mantel, Universidad de San Andrés

Paul M. Romer, NBER and University of California, Berkeley, "Dupuit Triangles and Deadweight Triangles: Lessons for Development from Endogenous Growth Theories"

Discussants: Anne O. Krueger, NBER and Duke University, and Guillermo Rozerwurcel, CEDES

Pablo Gerchunoff, Alberta Porto, and Santiago Urbiztondo, Instituto Torcuato di Telia, "From Public to Private Ownership: The Argentina Privatization Experience"

Discussants: Saul Keifman, FLACSO, and Ricardo López Murphy, FIEL

Oscar Altimir, United Nations Economic Commission for Latin America and the Caribbean, "Changes in Inequality and Poverty in Latin America"

Discussants: Luis Beccaria, CEPAL, and Osvaldo Schenone, Universidad de San Andrés

Nancy Birdsall and Estelle James, World Bank, "Efficiency and Equity in Social Spending: How and Why Governments Misbehave"

Discussants: Alberto Petrecolla, Instituto Torcuato di Tella, and Adolfo Sturzenegger, Universidad Nacional de la Plata

Bonomo and Garcia argue that high inflation may lead to adjustments to prices based on past inflation, timed to occur between adjustments that are optimal. Adjusting by accumulated inflation in between optimal adjustments makes disinflation harder, despite the fact that price adjustments are twice as frequent, they find.

Stabilizations based on exchange rate policies often have been accompanied by an initial expansion in output and consumption. But Calvo and Vegh show that a permanent reduction in the rate of devaluation leads to a fall in aggregate demand, as long as the elasticity of substitution over time is smaller than the elasticity of substitution between traded and home goods (which seems to be the relevant case).

Heymann and Sanguinetti present a simple model of inflationary taxation. In their analysis, the government confronts spending demands with a fixed-capacity tax system. The effects of such actions as tax indexing depend cumulatively on fiscal pressures. Higher-spending, lower-inflation states exist, but are not sustainable.

Fishlow and Friedman consider the effect of illegal tax evasion in estimating the losses caused by inflation. They proceed from a model that shows the behavior of maximizing agents in an intertemporal framework under the impact of changing prices. They find significant empirical relationships for Argentina, Brazil, and Chile. Thus, tax evasion contributes to the existence of equilibriums with low growth and high inflation, and high growth and low inflation.

Bayoumi and Eichengreen analyze exchange rate and monetary arrangements for the North American Free Trade Agreement from two perspectives: the theory of optimum currency areas, and comparisons with Europe. They find that the credibility gains to Mexico from an exchange rate peg, compared to those of Europe, are likely to be considerable. But the authors also find that the incidence of supply shocks is much more symmetrical among European countries than in Mexico and the United States, reflecting Mexico's status as an energy producer. This suggests that a monetary or exchange rate union would be more difficult to operate in North America, insofar as Mexico will incur significant costs from forsaking the exchange rate as an instrument of adjustment.

Current policy debates on the role of the government in LDCs usually refer to the relationship between public goods and economic performance under high costs of revenue collection. Chisari and Navajas address the provision of public inputs with optimal-but-costly indirect tax systems, and illustrate likely changes in the tax structure as a result of enforcement costs and evasion

activities. They also study conditions for the efficient provision of public inputs, considering their impact on endogenous evasion.

According to Romer, the most important contribution of new growth theory may be its renewed attention to why markets are successful and why government intervention can be harmful. Traditionally, we learn that the market efficiently solves a simple problem, allocating resources among a fixed set of alternatives to satisfy a set of conditions, and that the government can distort these conditions. An alternative, and fundamentally different, explanation dates back more than 150 years to the French engineer Jules Dupuit. He suggested that the more difficult and more important problem faced by the market preceded allocation: it was discovering or creating new alternative uses for resources.

Gerchunoff, Porto, and Urbiztondo briefly describe the main characteristics of the ongoing privatization process in Argentina. While they argue that privatizing immediately after a period of hyperinflation requires weighing microeconomic costs and macroeconomic benefits, they focus on microeconomic costs. Since it is probably true that the hyperinflation experience of 1989 left no other choice but to privatize most of the public sector's enterprises, the authors believe that this privatization process can be viewed as a compulsory investment—in which some desirable microeconomic effects from privatization were resigned in the hopes of macroeconomic stability—whose final merit can be judged only a few years from now.

Altimir assesses changes in income inequality and poverty in the 1970s and 1980s on the basis of a selection of available income distribution estimates and comparable poverty estimates for ten Latin American countries. He finds that diminishing inequality and poverty are associated with the rate and stability of growth, but only at high rates of growth. Recessive adjustments in the 1980s increased inequality and poverty, which were aggravated by instability, even during recovery. Only in the few instances of macroeconomic stability and sustained growth did that trend appear to have been reversed, however mildly.

Birdsall and James argue that, in many settings in the developing world, it is incorrect to assume that any policy decisions involve a trade-off between equity and efficiency. Classical welfare economics argues for a policy that concentrates government funding on public goods and encourages the market to do what it does best: fund and produce private goods. With public spending concentrated on services that yield public goods, the poor automatically benefit, even if they are not targeted. Since the rich also benefit, they may be reluctant to oppose these programs, even if they prefer government spending on private services from which they benefit more.

Also participating in the seminar were Aldo Arnavado, Universidad Nacional de Córdoba; Adolfo Canitrot and Gerardo della Paolera, Instituto Torcuato di Tella; Domingo Cavallo, Ministro de Economiá, Argentina; Joaquin Cottani and Carlos Sánchez, Ministerio de Economiá, Argentina; Eusebio Cleto del Rey, Universidad Nacional de Salta; Atilio Elizagaray, Fundación Antorchas; Martin Feldstein, NBER and Harvard University; Roberto Frenkel, CEDES; Norberto Gonzalez and Julio Olivera, Universidad de Buenos Aires; Alieto Gundagni, Ministerio de Relaciones Exteriores, Argentina; and Jose Antonio Ocampo, FEDESARROLLO.

These papers will be published in special issue of the *Journal of Development Economics*.

Bureau News

Willard Thorp Dies at Age 92

Willard Long Thorp, a director emeritus of the NBER, died in May at age 92. Thorp was one of the first economists hired at the new National Bureau of Economic Research in 1923. His early studies led to the 1926 publication *Business Annals*, a book of economic statistics for 17 countries dating to 1890.

Thorp had served three presidents—Franklin Delano Roosevelt, Truman, and Kennedy—in domestic and foreign affairs. He also represented the United States at the postwar conference that led to the creation of the General Agreement on Tariffs and Trade, and at the United Nations. Further, he helped to design, negotiate, and administer the Marshall Plan. In addition to his career in government, he worked as an economist for Dun & Bradstreet and taught at Amherst College.

Thorp was a director of the NBER from 1956 to 1975 before he became a director emeritus.

Asset Pricing Program Meets

Members and guests of the NBER's Program in Asset Pricing met in Cambridge on March 20. Six papers, selected by Program Director John Y. Campbell, NBER and Princeton University, were discussed:

Pierluigi Balduzzi and Silverio Foresi, New York University, and Guiseppe Bertola, NBER and Princeton University, "Nonlinearities in Asset Prices and Infrequent Noise Trading"

Discussant: Kenneth A. Froot, NBER and Harvard University

John H. Cochrane, NBER and University of Chicago, "A Cross-Sectional Test of a Production-Based Asset Pricing Model" (NBER Working Paper No. 4025)

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

Steven L. Heston, Yale University, "A Closed-Form Solution for Options with Stochastic Volatility, with Application to Bond and Currency Options"

Discussant: David Bates, NBER and University of Pennsylvania

Andrew B. Abel, NBER and University of Pennsylvania, "Asset Pricing with a Fixed Capital Stock"

Discussant: Ravi Jagannathan, University of Minnesota

Zhaohui Chen, Columbia University, and Alberto Giovannini, NBER and Columbia University, "Estimating Expected Exchange Rates Under Target Zones" (NBER Working Paper No. 3955)

Discussant: Robert E. Cumby, NBER and New York University

Bernard Dumas, NBER and University of Pennsylvania, and Bruno Solnik, Hautes Ecoles Commerciales, "The World Price of Exchange Rate Risk"

Discussant: Wayne E. Ferson, University of Chicago

Models of asset price determination often assume that financial market participants may be aggregated into a "representative" individual, whose investments are based on fundamentals (that is, on the expected magnitude and riskiness of the payoffs accruing to the asset's owner). Balduzzi, Foresi, and Bertola relax the representative–individual assumption and focus on the role of trade among heterogeneous individuals in asset price determination. Their model features "speculators" who are always present in the market, and "noise traders" who submit market orders of given size. The model can explain excess serial correlation and heteroscedasticity of asset prices and returns, even when driving processes follow simple linear processes.

The central challenge for research in macroeconomics-and-finance is to find the macroeconomic risk factors that explain variations in average returns on assets. Some assets regularly have higher expected returns than others, and expected returns on given assets are somewhat predictable. This variation presumably occurs because assets have different and time-varying exposures to macroeconomic risk factors, but the nature of the risk factors is still an open question. Cochrane presents a production-based model, in which he infers the risk factors for asset returns from investment data by examining the behavior of firms. He also provides an easy technique for estimating, testing, and comparing any dynamic conditional model for the risk factors in asset returns. In tests on NYSE portfolios, the investment model explains cross-sectional and time-series variation in expected returns about as well as dynamic extensions of standard finance models, including the Capital Asset Pricing Model, and dramatically better than the consumption-based model.

Heston derives a new closed-form solution for the price of a European call option. He generalizes the Black–Scholes (1973) formula by allowing the variance of the stock to change randomly over the life of the option. He also shows how to incorporate random interest rates. Therefore, the model can be applied to bond options and foreign currency options as well as stock options. Simulations show that the new stochastic volatility model can explain biases in the Black–Scholes model.

Over the last century in the United States, the average rate of return on stocks exceeded the average rate of return on short-term bills by about 6 percent per year. The fact that standard models of asset pricing are unable to account for such a large excess return is known as the "equity premium puzzle." Abel allows for production and for a class of richer processes driving the underlying risk in the economy. He then derives simple expressions for the expected rates of return on stocks and bills, and shows that the class of richer processes reduces the predicted excess return on stocks, thereby exacerbating, rather than solving, the equity premium puzzle.

Chen and Giovannini develop a simple econometric procedure for estimating expected exchange rates under target zones. They use the linear projection methodology to make predictions without relying on any prior structural or distributional assumptions. At the same time, they demonstrate that such a methodology has to be modified in order to explain the presence of the fluctuation band. They show that the band effect is nontrivial for narrow target zones such as the Bretton Woods system. They also find that the unconditional distributions of exchange rates can take several different shapes, which may correspond to possibly widely different monetary and exchange rate intervention policies.

Dumas and Solnik consider a world capital market with a heterogenous investor population. Investors from different countries pay different prices for the goods that consume their income from investments. In this setting, the international Capital Asset Pricing Model incorporates rewards for exchange rate risk in addition to the traditional reward for market-covariance risk. Dumas and Solnik investigate whether these additional risk premiums play a significant role in the pricing of securities.

Other participants in the Asset Pricing program meeting were NBER associates Geoffrey Carliner; Stephen G. Cecchetti, Ohio State University; George M. Constantinides and Kenneth R. French, University of Chicago; Kathryn M. E. Dominguez, James H. Stock, and Philippe Weil, Harvard University; John C. Heaton, Andrew W. Lo, and Robert S. Pindyck, MIT; Miles S. Kimball, University of Michigan; Bruce N. Lehmann, Columbia University; Karen K. Lewis, A. Craig MacKinlay, and Robert F. Stambaugh, University of Pennsylvania; and Stanley E. Zin, Carnegie–Mellon University.

Meeting on Industrial Organization

When the NBER's Program in Industrial Organization met in Cambridge on May 8, the agenda prepared by Program Director Nancy L. Rose of MIT was:

Brian Bowen and Peter Pashigian, University of Chicago, "Why Has the Pricing of New Cars Changed?"
Discussant: Timothy F. Bresnahan, NBER and Stanford University

Patrick Kaufmann, Georgia State University, and Francine LaFontaine, University of Michigan, "Costs of Control: The Sources of Economic Rents for McDonald's Franchisees"
Discussant: Paul L. Joskow, NBER and MIT

Robert W. Staiger and Frank A. Wolak, NBER and Stanford University, "The Determinants and Impacts of Antidumping Suit Petitions in the United States: An Industry-Level Analysis"
Discussant: Carl Shapiro, NBER and University of California, Berkeley

Thomas Gilligan, University of Southern California, "Imperfect Competition and Basing Point Pricing: An Application to the Softwood Plywood Industry"
Discussant: Peter C. Reiss, NBER and Stanford University

Bowen and Pashigian explain why the seasonal variation in retail prices of new cars disappeared, and the depreciation rate of automobiles declined, from 1953 to 1989. The cost of introducing a model change increased, so the frequency and magnitude of such changes decreased. The authors show that the seasonal variation in new car prices decreases as the cost of a model change increases. When a major model change *is* introduced, the depreciation rate of a year-old automobile with the same brand name increases.

Kaufmann and LaFontaine use financial data to study the operation of McDonald's franchises. They find that the franchise arrangement with the parent corporation encourages efficient operation of the establishment. Because of this efficiency, franchisees earn returns in excess of their opportunity costs—that is, they earn economic rents. In addition, Kaufmann and LaFontaine find these rents could not be diverted to the parent company through a licensing fee, since the franchisees would not be able to raise the money for the license.

Staiger and Wolak find more antidumping suits filed in industries with larger import penetration ratios, lower capacity utilization rates, and less value added per dollar of output produced. In addition, they find that larger industries file these suits more often than smaller industries do. The major impact of filing an antidumping suit is a large decrease in imports, and an increase in domestic output when the government decides that dumping has taken place. The imposition of duties leads to the expected negative impact on imports and positive impact on domestic output. Imports actually increase immediately after the filing of an antidumping suit by domestic producers.

Using data from the softwood plywood industry during the mid-1970s, Gilligan finds that basing-point pricing is consistent with marginal cost pricing by firms at the base site, but imperfect competition among other firms. He finds that roughly 35 percent of the transcontinental rail costs of shipping plywood were collected through phantom freight charges by firms not at the base site. The antitrust imposition of mill pricing reduced the markups to those firms by over 2 percent.

Reprints Available

The following NBER Reprints, intended for nonprofit education and research purposes, are now available. (Previous issues of the NBER Reporter list titles 1-1711 and contain abstracts of the Working Papers cited below.)

These reprints are free of charge to corporate associates. **For all others there is a charge of $5.00 per reprint requested. (Outside of the United States, add $10.00 per order for postage and handling.) Advance payment is required on all orders. Please do not send cash.** Reprints must be requested by number, in writing, from: Reprint Series, National Bureau of Economic Research, 1050 Massachusetts Avenue, Cambridge, MA 02138-5398.

1712. "Capital Flows, Foreign Direct Investment, and Debt–Equity Swaps in Developing Countries," by Sebastian Edwards, 1991 (NBER Working Paper No. 3497)

1713. "Explaining Fiscal Policies and Inflation in Developing Countries," by Sebastian Edwards and Guido Tabellini, 1991 (NBER Working Paper No. 3493)

1714. "Measures of Prices and Price Competitiveness in International Trade in Manufactured Goods," by Irving B. Kravis, Robert E. Lipsey, and Linda Molinari, 1991 (NBER Working Paper No. 3442)

1715. "Interactions Between Domestic and Foreign Investment," by Robert E. Lipsey and Guy V. G. Stevens, 1992 (NBER Working Paper No. 2714)

1716. "Money versus Credit Rationing: Evidence for the National Banking Era, 1880–1914," Michael D. Bordo, Peter Rappoport, and Anna J. Schwartz, 1992 (NBER Working Paper No. 3689)

1717. "Competitive Externalities and the Optimal Seigniorage," by Joshua Aizenman, 1992 (NBER Working Paper No. 2937)

1718. "The Staying Power of Leveraged Buyouts," by Steven N. Kaplan, 1991 (NBER Working Paper No. 3653)

1719. "Terms-of-Trade Disturbances, Real Exchange Rates, and Welfare: The Role of Capital Controls and Labor Market Distortions," by Sebastian Edwards and Jonathan D. Ostry, 1992 (NBER Working Paper No. 2907)

1720. "Money and Prices in Colonial America: A New Test of Competing Theories," by Bennett T. McCallum, 1992 (NBER Working Paper No. 3383)

1721. "Notes on Dynamic Factor Pricing Models," Bruce N. Lehmann, 1992 (NBER Working Paper No. 3677)

1722. "Learning from the Reagan Deficits," by Benjamin M. Friedman, 1992 (NBER Working Paper No. 4022)

1723. "Exchange Rate Dynamics Under Stochastic Regime Shifts: A Unified Approach," by Kenneth A. Froot and Maurice Obstfeld, 1991 (NBER Working Paper No. 2835)

1724. "Debt, Deficits, and Inflation: An Application to the Public Finances of India," by Willem H. Buiter and Urjit R. Patel, 1992 (NBER Working Paper No. 3287)

1725. "A Contribution to the Empirics of Economic Growth," by N. Gregory Mankiw, David H. Romer, and David N. Weil,1992 (NBER Working Paper No. 3541)

1726. "Reappraisal of the Phillips Curve and Direct Effects of Money Supply on Inflation," by Albert Ando, Flint Brayton, and Arthur Kennickell, 1991

1727. "The Income Tax as Insurance: The Casualty Loss and Medical Expense Deductions and the Exclusion of Medical Insurance Premiums," by Louis Kaplow, 1991 (NBER Working Paper No. 3723)

1728. "Tax Policy and Business Fixed Investment in the United States," by Alan J. Auerbach and Kevin Hassett,1992 (NBER Working Paper No. 3619)

1729. "Tax Credits for Debt Reduction," by Michael P. Dooley and Elhanan Helpman, 1992 (NBER Working Paper No. 3137)

1730. "Recent U.S. Investment Behavior and the Tax Reform Act of 1986: A Disaggregate View," by Alan J. Auerbach and Kevin Hassett,1991 (NBER Working Paper No. 3626)

Bureau Books

Tax Policy and the Economy, Volume 6

Tax Policy and the Economy, Volume 6, edited by James M. Poterba, is now available from MIT Press. The price is $28.95 for clothbound and $14.95 for paperback.

This volume includes discussions of: carbon and other energy taxes, corporate revenues since the tax reform of 1986, and government policy toward retirement saving. It should interest economists, accountants, those involved in formulating tax policy, and the business community in general.

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

Tax Policy and the Economy, Volume 6 may be ordered directly from the MIT Press, 55 Hayward Street, Cambridge, MA 02142; their toll-free telephone number is 800-356-0343.

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

Four New Volumes from University of Chicago Press

Four new NBER titles will be offered by the University of Chicago Press this summer and fall.

In July, ***The Political Economy of Tax Reform: NBER–East Asia Seminar on Economics, Volume 1***, priced at $60.00, will be available. This volume is based on a conference sponsored jointly by the NBER and the Korea Development Institute. In it, experts from Taiwan, Korea, the Philippines, Japan, Thailand, Canada, Israel, and the United States analyze the economic effects and international dimensions of the major tax reforms of the 1980s. This book should interest economists, policymakers, and members of the international business community.

Editors Takatoshi Ito and Anne O. Krueger are NBER research associates in international studies. Ito is also a professor of economics at Hitotsubashi University; Krueger is a professor of economics at Duke University.

Output Measurement in the Service Sectors, edited by Zvi Griliches, and ***Canada–U.S. Tax Comparisons***, edited by John B. Shoven and John Whalley, will be available in September. The Griliches book, priced at $75.00, is the 56th volume in the NBER's Studies in Income and Wealth. It includes descriptions by government economists of current statistics on the service sector. Other chapters discuss the measurement of output in banking, education, daycare, and other industries. There are also analyses of service industries in France and Sweden. Griliches, who was assisted by Ernst R. Berndt, Timothy F. Bresnahan, and Marilyn E. Manser in preparing this volume, directs the NBER's Program in Productivity and is a professor of economics at Harvard University.

The Shoven–Whalley book, priced at $55.00, is part of a project that compares social policies in Canada and the United States. The authors find, among other things, a surprising independence in the tax policy of the two countries. Yet, despite different policies, outcomes often are quite similar: for example, the two tax systems generate about the same amount of revenue and produce comparable distributions of income.

Shoven and Whalley are research associates in the NBER's Program in Public Economics. Shoven is also a professor of economics at Stanford University; Whalley is a professor of economics at the University of Western Ontario.

In October, ***Immigration and the Workforce: Economic Consequences for the United States and Source Areas,*** edited by George J. Borjas and Richard B. Freeman, will be available. Its price is $45.00. This volume analyzes the effect of immigration on the U.S. economy, and on such source areas as Puerto Rico, through the late 1980s. It should interest labor and development economists, demographers, sociologists, policy specialists, and students.

Borjas is an NBER research associate in labor studies and a professor of economics at the University of California, San Diego. Freeman directs the NBER's labor studies program and is a professor of economics at Harvard University.

Current Working Papers

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

Multiple authors are listed alphabetically. *Journal of Economic Literature* (JEL) subject codes, when available, are listed after the date of the paper, followed by the NBER 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 April are presented below. For previous papers, see past issues of the *NBER Reporter*. Working Papers are intended to make results of NBER research available to other economists in preliminary form to encourage discussion and suggestions for revision before final publication. They are not reviewed by the Board of Directors of the NBER.

Technical Papers

Evaluating Risky Consumption Paths: The Role of Intertemporal Substitutability

Maurice Obstfeld
NBER Technical Paper No. 120
June 1992
JEL Nos. E20, D58
Economic Fluctuations

In dynamic stochastic welfare comparisons, a failure to distinguish clearly between risk aversion and intertemporal substitutability can result in misleading assessments of the impact of risk aversion on the welfare costs of consumption-risk changes. The problem arises in any setting in which uncertainty is propagated over time—notably, but not exclusively, in economies with stochastic consumption trends. Regardless of the preference setup adopted, an increase in risk aversion amplifies the per period costs of risks. The weights consumers use to cumulate the per period costs of risks with persistent effects should depend on intertemporal substitutability as well as on risk aversion, though. Under time-separable expected-utility preferences, an increase in the period utility function's curvature alters the welfare effect of risk for reasons that are in part unrelated to risk aversion.

Deciding Between I(1) and I(0)

James H. Stock
NBER Technical Paper No. 121
June 1992
JEL No. C22
Monetary Economics

This paper proposes a class of procedures that consistently classify the stochastic component of a time se-

ries as being integrated either of order zero [I(0)] or one [I(1)] for general I(0) and I(1) processes. These procedures entail the evaluation of the asymptotic likelihoods of certain statistics under the I(0) and I(1) hypotheses. These likelihoods do not depend on nuisance parameters describing short-run dynamics, and they diverge asymptotically, so their ratio provides a consistent basis for classifying a process as I(1) or I(0). Bayesian inference can be performed by placing prior mass only on the point hypotheses "I(0)" and "I(1)" without needing to specify parametric priors within the classes of I(0) and I(1) processes; the result is posterior odds ratios for the I(0) and I(1) hypotheses.

I develop these procedures for general polynomial and piecewise linear detrending. When applied to the Nelson–Plosser data with linear detrending, they largely support the original Nelson–Plosser inferences. With piecewise-linear detrending, these data are typically uninformative, producing Bayes factors that are close to one.

Specification Testing in Panel Data with Instrumental Variables

Gilbert E. Metcalf
Technical Paper No. 123
June 1992
JEL Nos. C12, C15, C23
Public Economics

This paper shows how to test whether instrumental variables are correlated with individual effects in a panel dataset. I show that the correlated fixed-effects specification tests developed by Hausman and Taylor (1981) extend analogously to panel datasets with endogenous right-side variables. In the panel data context, different sets of instrumental variables can be used to construct the test. Asymptotically, in many cases, the test is more efficient if an incomplete set of instruments is used. However, in small samples, one is likely to do better by using the complete set of instruments. Monte Carlo results demonstrate the likely gains for different assumptions about the degree of variance in the data across observations relative to variation across time.

Inference in Time-Series Regression When the Order of Integration of a Regressor Is Unknown

Graham Elliott and **James H. Stock**
NBER Technical Paper No. 122
June 1992
JEL Nos. C32, C22
Monetary Economics

The distribution of statistics testing restrictions on the coefficients in time-series regressions can depend on the order of integration of the regressors. In practice, the order of integration rarely is known. This paper examines two conventional approaches to this problem, finds them unsatisfactory, and proposes a new procedure.

The two conventional approaches—simply to ignore unit root problems, or to use unit root pretests to determine the critical values for second-stage inference—often induce substantial size distortions. In the case of unit root pretests, this occurs because type I and II pretest errors produce incorrect second-stage critical values and because, in many empirically plausible situations, the first-stage test (the unit root test) and the second-stage test (the exclusion restriction test) are dependent. Monte Carlo simulations reveal size distortions even if the regressor is stationary but has a large autoregressive root: that might arise, for example, in a regression of excess stock returns against the dividend yield.

In the proposed alternative procedure, the second-stage test is conditional on a first-stage "unit root" statistic developed in Stock (1992); the second-stage critical values vary continuously with the value of the first-stage statistic. The procedure has the correct size asymptotically and has good local asymptotic power against Granger-causality alternatives.

Historical Factors in Long-Run Growth

Were Heckscher and Ohlin Right? Putting the Factor Price-Equalization Theorem Back into History

Kevin O'Rourke and **Jeffrey G. Williamson**
NBER Historical Paper No. 37
June 1992
JEL Nos. F10, N70

Primarily because of transport improvements, commodity prices in Britain and America tended to equalize during 1870–1913. This equalization was manifested not only by the great New World grain invasion of Europe, but also in intermediate primary products and manufactures. Writing in 1919 and 1924, Heckscher and Ohlin argued that these events should have contributed to factor price equalization.

Based on Williamson's research, reported elsewhere, we show that Anglo–American real wages did converge over this period as part of a general convergence between the Old and the New World. We apply the venerable Heckscher–Ohlin trade model to the late 19th century Anglo–American experience and find that they were right: at least half of the real wage convergence observed can be assigned to commodity price equalization. Furthermore, these events had profound influences on relative scarcities of land and capital. It appears that this late 19th century episode was the start of world commodity and factor market integration that is ongoing.

Early Indicators of Later Work Levels, Disease, and Death

Robert W. Fogel and **Larry T. Wimmer**
NBER Historical Paper No. 38
June 1992
JEL Nos. N31, N32, I12

This paper describes a collaborative project designed to create a public-use tape suitable for a prospective study of aging among a random sample of 39,616 men mustered into 331 companies of the Union Army. We want to measure the effect of socioeconomics and biomedical factors during childhood and early adulthood on the development of specific chronic diseases at middle age and later, on labor force participation beyond middle age, and on life span. We survey the nature and quality of the data and sources to be included in the study, discuss the characteristics of a subsample of recruits from 20 companies, look at whether Union Army recruits are representative of the northern white male population, and examine several issues regarding selection bias.

NBER Working Papers

"Excess Volatility" and the German Stock Market, 1876–1990

Marco Becht and **J. Bradford De Long**
NBER Working Paper No. 4054
April 1992
JEL Nos. N20, N23, N24
Asset Pricing

We use data on real prices and dividends to determine in what periods in the past century, and to what degree, the German stock market has possessed "excess volatility." We find no evidence of excess volatility in the German stock market before World War I, but some evidence of excess volatility after World War II. The role of the German *Großbanken* before World War I might explain the low comparative volatility of German stock indexes before 1914.

Spatial and Temporal Aggregation in the Dynamics of Labor Demand

Daniel S. Hamermesh
NBER Working Paper No. 4055
April 1992
JEL No. J23
Labor Studies

This paper demonstrates the general difficulty of inferring the structure of adjustment costs from aggregated data, including industry data, except in the unlikely case that costs are symmetric and quadratic at the micro level. It then examines the implications of this difficulty for cross-national comparisons of adjustment costs, and for attempts to infer the structure of these costs without micro data.

In the voluminous literature on dynamic labor demand, studies based on annual data generally find longer lags than those that use quarterly data, which in turn produce longer lags than models estimated using monthly data. However, using a consistent set of U.S. industry time series and assuming quadratic symmetric costs, the estimated length of the lag is independent of the frequency of observation. This conclusion clearly is not general: if we assume that the costs of adjusting labor demand are lumpy, then inferences about their structure differ greatly, depending on how often the data are observed.

A Theory of Persistent Income Inequality

Steven N. Durlauf
NBER Working Paper No. 4056
April 1992
JEL Nos. D31, D90, J62
Economic Fluctuations, Growth

This paper explores the dynamics of income inequality by studying the evolution of investment in human capital and choice of neighborhood for a population of families. Parents can affect their children's future income through the choice of a neighborhood in which to live. Neighborhood location affects children in two ways: First, the "level" of education depends on the total income of a neighborhood, because all school funding is determined by majority vote. Further, neighborhoods cannot borrow to supplement tax revenues available for education. Second, future individual productivity is affected by the income distribution within a neighborhood, which in turn reflects cultural influences, such as the presence of successful role models. These forces interact to stratify the economy, as families segregate themselves into economically homogeneous neighborhoods.

My model has two important features. First, although starting from identical conditions, families can have different long-term income, leading to persistent income inequality. Second, areas of permanent poverty can emerge in a growing economy as neighborhoodwide feedback effects transmit poverty across generations.

Attitudes Toward Inflation and the Viability of Fixed Exchange Rates: Evidence from the EMS

Susan M. Collins and **Francesco Giavazzi**
NBER Working Paper No. 4057
April 1992
JEL No. F30
International Finance and Macroeconomics

Many multiple-country fixed exchange rate regimes eventually have fallen apart. In light of these failures,

why has the EMS been so successful in stabilizing exchange rates among members, and in expanding its membership? This paper argues that one key to the explanation lies in a convergence in attitudes toward inflation and unemployment among EMS members since the late 1970s.

We present new empirical evidence for this convergence using household survey data for eight European countries during 1974–90. We find that initially countries with high inflation—France and Italy—experienced a decrease in tolerance for inflation relative to unemployment. Germany and other countries with low inflation, in contrast, appear to have experienced a decrease in tolerance for unemployment.

Using Regional Variation in Wages to Measure the Effects of the Federal Minimum Wage

David Card
NBER Working Paper No. 4058
April 1992
Labor Studies

The imposition of a national wage standard sets up a useful natural experiment in which the "treatment effect" varies across states depending on the fraction of workers earning less than the new minimum. I use this idea to evaluate the effect of the April 1990 increase in the federal minimum wage on teenage wages, employment, and school enrollment. Interstate variation in teenage wages was high at the end of the 1980s, in part because 16 states had enacted state-specific minimums above the prevailing federal rate. Comparisons of grouped and individual state data confirm that the rise in the minimum wage significantly increased teenage wages. There is no evidence of corresponding losses in teenage employment, or of changes in teenage school enrollment.

Productivity and Firm Turnover in Israeli Industry: 1979–88

Zvi Griliches and **Haim Regev**
NBER Working Paper No. 4059
April 1992
JEL Nos. C81, D24, L6, O3
Productivity

Analyzing a large panel dataset on Israeli industrial firms, we find that most of the growth in aggregate productivity comes from productivity changes within firms rather than from entry, exit, or differential growth. Firms that will exit in the future have lower productivity performance several years earlier. Overall, there was little total factor productivity growth in Israeli industry during 1979–88.

R and D, Investment, and Industry Dynamics

Saul Lach and **Rafael Rob**
NBER Working Paper No. 4060
April 1992
JEL No. O30
Productivity

We present a model of industry evolution in which the dynamics are driven by a process of endogenous innovations, followed by subsequent embodiments in physical capital. Traditionally, the only distinction between R and D and physical investment has been one of labeling: the first process accumulates an intangible stock (knowledge), while the second accumulates physical capital. Both stocks affect output in a symmetric fashion.

We argue that the story is not that simple, and there is more to it than differences in the object of accumulation. Our model stresses the causal relationship between past R and D expenditures and current investments in machinery and equipment. This pattern of causality, which is supported by the data, also explains the observed higher volatility of physical investment (relative to R and D expenditures).

Do the Costs of a Carbon Tax Vanish When Interactions with Other Taxes Are Accounted For?

Lawrence H. Goulder
NBER Working Paper No. 4061
May 1992
JEL Nos. H2, H23, Q3
Public Economics

Previous analyses of U.S. carbon taxes have tended to ignore interactions between this tax and other preexisting U.S. taxes. This paper assesses the effects of the carbon tax using a model that addresses these interactions.

We find that the GNP and welfare costs of the carbon tax are significantly lower than what would be predicted if tax interactions were disregarded. When the revenues are used to finance reductions in marginal taxes at the personal or corporate level, the welfare costs are 25–32 percent lower than when the revenues finance lump-sum reductions in taxes. Preexisting distortions—specifically the relatively light taxation of fossil-fuel-producing industries in comparison with other industries—imply that the gross efficiency costs of carbon taxes are about 15 percent lower than would be the case if fossil-fuel-producing industries were not tax-favored initially.

A Growth Model of Inflation, Tax Evasion, and Financial Repression

Nouriel Roubini and **Xavier Sala-i-Martin**
NBER Working Paper No. 4062
May 1992
Growth, Monetary Economics

We study the effects of financial repression on long-term growth and try to explain why optimizing govern-

ments might want to repress the financial sector. We also explain why inflation may be negatively related to growth, even though it does not affect growth directly. We argue that governments repress the financial sector mainly because it is the source of "easy" resources for the public budget. Our model implies that financial development reduces money demand. Hence, if the government allows for financial development, then the inflation tax base and the chance to collect seigniorage are reduced. To the extent that the financial sector increases the efficiency of the allocation of savings to productive investment, the choice of the degree of financial development will have real effects on the saving and investment rate, and on the growth rate of the economy.

We show that in countries where tax evasion is large, the government optimally will choose to repress the financial sector in order to increase seigniorage taxation. This policy then will reduce the efficiency of the financial sector, increase the costs of intermediation, reduce the amount of investment, and reduce the steady-state rate of growth of the economy. Financial repression therefore will be associated with high tax evasion, low growth, and high inflation.

Taxation and the Structure of Labor Markets: The Case of Corporatism

Jonathan Gruber, Lawrence H. Summers, and **Rodrigo Vergara**
NBER Working Paper No. 4063
May 1992
Public Economics

We propose an explanation for the wide variation in rates of taxation across developed economies, based on differences in labor market institutions. In "corporatist" economies, which feature centralized labor markets, taxes on labor input will be less distortionary than when labor supply is determined individually. Since the level of labor supply is set by a small group of decision-makers, these individuals will recognize the linkage between the taxes that workers pay and the benefits that they receive. Labor tax burdens are indeed higher in more corporatist nations, and nonlabor taxes are lower, which is consistent with this theory. There is also some evidence that the distortionary effects of labor taxes are lower in more corporatist economies.

Foreign Trade in Eastern Europe's Transition: Early Results

Dani Rodrik
NBER Working Paper No. 4064
May 1992
JEL Nos. F13, F14, P33
International Trade and Investment

By the end of 1991, Czechoslovakia, Hungary, and Poland had achieved a substantial degree of openness to foreign trade. In all three countries, trade is now demonopolized, and licensing and quotas play a very small role. Exchange controls virtually have disappeared for current-account transactions. Judging by partner statistics, export performance has been impressive in all three countries, and import booms are underway at least in Hungary and Poland. However, there is no evidence that exporters have had any success in finding western markets for the exports they have lost in eastern markets. The collapse of the CMEA represents a significant shock, amounting to a loss of real income of 3.5 percent of GDP in Poland and 7–8 percent of GDP in Hungary and Czechoslovakia. Export performance is attributable to exchange rate policy in part, but the collapse of domestic demand possibly has played an even more important role. Finally, trade liberalization appears to have had little effect on price discipline so far, in large part because of the substantial devaluations that have accompanied it.

Top Executive Rewards and Firm Performance: A Comparison of Japan and the United States

Steven N. Kaplan
NBER Working Paper No. 4065
May 1992
Corporate Finance

This paper compares CEO and top management turnover and its relationship to firm performance in the largest companies (by sales) in Japan and the United States. Japanese top managers are older and have shorter tenures as top managers than their U.S. counterparts do. Overall, however, turnover–performance relationships are economically and statistically similar: turnover is negatively related to stock, sales, and earnings performance in both countries. Turnover in Japan is particularly sensitive to low earnings. Evidence on executive compensation confirms that Japanese executives own less stock and receive lower cash compensation than U.S. executives do. Cash compensation–performance relationships, nevertheless, are also similar in magnitude to those found for U.S. executives in earlier studies.

Empirical Linkages Between Democracy and Economic Growth

John F. Helliwell
NBER Working Paper No. 4066
May 1992
JEL Nos. F43, O57, P51
Growth, International Trade and Investment

Using cross-sectional and pooled data for up to 125 countries from 1960 to 1985, this paper evaluates the linkages between democracy and economic growth. I find the effects of income on democracy to be robust and positive. I then assess the effects of several measures of democracy on growth, using a comparative framework in which the growth of per capita GDP depends

negatively on initial income levels, and positively on rates of investment in physical and human capital. After adjusting for the simultaneous determination of income and democracy, I find the *direct* effect of democracy on subsequent economic growth to be negative but insignificant. If democracy has a positive indirect effect on income, flowing through its effect on education and investment, then its negative direct effect on growth will be offset. Therefore, it is still not possible to identify any systematic net effects of democracy on subsequent economic growth.

Estimating the Payoff to Schooling Using the Vietnam-Era Draft Lottery

Joshua D. Angrist and **Alan B. Krueger**
NBER Working Paper No. 4067
May 1992
JEL No. J2
Labor Studies

Between 1970 and 1973, priority for military service was assigned randomly to draft-age men in a series of lotteries. Many men who were at risk of being drafted managed to avoid military service by enrolling in school and obtaining an educational deferment. This paper uses the draft lottery as a natural experiment to estimate the return to education and the veteran premium. Our estimates are based on special extracts of the Current Population Survey for 1979 and 1981–5. We find that an extra year of schooling, acquired in response to the lottery, is associated with 6.6 percent higher weekly earnings.

The Expected Timing of EMS Realignments: 1979–83

Susan M. Collins
NBER Working Paper No. 4068
May 1992
JEL No. F30
International Finance and Macroeconomics

This paper develops and estimates a model of the time during the early years of the European Monetary System when market participants expected the French franc to be devalued relative to the German deutschemark. This expected time of exchange rate realignment depends on when foreign exchange reserves in the Banque de France first fall below a critical threshold level. I use the term structure of forward exchange rate premiums to indicate perceived probabilities of realignment over various time horizons. I find that the expected timing of realignments was quite sensitive to the level of reserves in France and to factors that affect the mean rate of change of reserves.

Strategic Trade Policy with Incompletely Informed Policymakers

S. Lael Brainard and **David Martimort**
NBER Working Paper No. 4069
May 1992
JEL Nos. F13, L51
International Trade and Investment

Ever since the inception of research on strategic trade policy, economists have warned that the informational requirements are high, and unlikely to be met in practice. This paper investigates the implications of incomplete information for a simple, rent-shifting trade policy of the type proposed in Brander–Spencer (1985). We find that asymmetric information undermines the precommitment effect of unilateral government intervention. This "screening" effect induces a downward distortion in the optimal subsidy; it may be so large as to require a tax, rather than a subsidy, for high levels of uncertainty. Second, in contrast to the full-information case with strategic substitutes, the introduction of a rival interventionist government, by reducing the incentive for the domestic firm to misrepresent its private information, reinforces rather than countervails the precommitment effect. Finally, when a nonintervention-profit participation constraint is substituted for the conventional zero-profit participation constraint to take into account the special relationship between firms and policymakers in trade, the government eschews intervention altogether for high levels of uncertainty.

Do Doctoral Students' Financial Support Patterns Affect Their Times-to-Degree and Completion Probabilities?

Ronald G. Ehrenberg and **Panagiotis G. Mavros**
NBER Working Paper No. 4070
May 1992
JEL Nos. I21, J44
Labor Studies

Projections of forthcoming shortages of Ph.D.'s abound. Part of the reason is that American college graduates are much less likely to receive doctorates today than they were 20 years ago. Two important factors in this decline may be the increase that occurred over the period in the length of time necessary for doctorate students to complete their programs and the low completion rates of entrants into doctoral programs.

One of the policies urged to prevent future Ph.D. shortages is increasing support for graduate students. But surprisingly little empirical evidence is available on how different types of support (fellowships, research assistantships, teaching assistantships) are likely to influence times-to-degree and completion rates.

To estimate how graduate student financial support patterns influence these outcomes, our paper uses data on all graduate students who entered Ph.D. programs in four fields during a 25-year period at a single major uni-

versity. We find that completion rates and mean durations of times-to-completion are sensitive to the types of financial support the students received. Other things held constant, students who receive fellowships or research assistantships have higher completion rates and shorter times-to-degree than students who receive teaching assistantships or tuition waiv-ers, or who are totally self-supporting. A major finding is that the impact of financial support patterns on the fraction of students who complete programs is much larger than its impact on mean durations of times-to-degree.

The GATT, Dispute Settlement, and Cooperation

Dan Kovenock and **Marie C. Thursby**
NBER Working Paper No. 4071
May 1992
JEL Nos. F1, K3
International Trade and Investment

This paper analyzes the GATT (General Agreement on Tariffs and Trade) and its dispute settlement procedure (DSP) in the context of a supergame model of international trade, featuring both explicit and implicit agreements. An explicit agreement, such as the GATT, may be violated at some positive cost, in addition to retaliatory actions that might be induced by the violation. This cost arises from "international obligation," a phenomenon frequently mentioned in the legal literature on the GATT. We focus on how international obligation affects two aspects of the GATT-DSP: unilateral retaliation, and the effect of inordinate delays in the operation of the DSP.

The Production and Cost Structure of Israeli Industry: Evidence from Individual Firm Data

Arie Bregman, Melvyn A. Fuss, and **Haim Regev**
NBER Working Paper No. 4072
May 1992
JEL Nos. L60, O53
Productivity

This paper presents estimates of production and cost functions based on a time-series, cross-section dataset on Israeli industry. One surprising finding is the relative inefficiency of large firms listed on the stock exchange. Histadrut and public firms appear to be poor performers in a number of dimensions. Large public firms are inefficient and pay excessively high wages. Small public firms (fewer than 300 employees) are not inefficient, but pay excessive wages. Large Histadrut firms are inefficient, while small Histadrut firms pay excessive wages.

The wage structure in Israeli industry is related systematically to the controls on heterogeneity used in this study. One productivity-related result is that firms experiencing higher-than-expected productivity also pay higher-than-expected wages, and about 70 percent of this productivity "bonus" appears as a wage rate increment.

Labor Market Segmentation, Wage Dispersion, and Unemployment

William T. Dickens and **Kevin Lang**
NBER Working Paper No. 4073
May 1992
JEL No. J64
Labor Studies

This paper briefly reviews the empirical evidence on labor market segmentation and presents some new results on the similarity of the pattern of segmentation across 66 countries. The paper also considers how unemployment might be understood in a labor market segmentation framework.

Existing models of unemployment in a dual labor market suggest that unemployment should be concentrated among those who ultimately are employed in high-wage jobs. In fact, unemployment seems to be concentrated among workers who likely are in low-wage jobs. This is so even though some workers find low-wage jobs easy to obtain. We develop a segmented labor market model capable of explaining these facts, and then explore its implications for the aggregate unemployment rate. We find our model is consistent with the facts.

Global Financial Markets and the Risk Premium on U.S. Equity

K. C. Chan, G. Andrew Karolyi, and **René M. Stulz**
NBER Working Paper No. 4074
May 1992
JEL No. G12
Asset Pricing

We document that there is a significant foreign influence on the risk premium of U.S. assets. We find that the conditional expected excess return on U.S. stocks is related positively to the conditional covariance of the return of these stocks with the return on a foreign index, but is not related to its own conditional variance. Further, we cannot reject the international version of the Capital Asset Pricing Model. We present evidence for different model specifications, multiple-day returns, and alternative proxies of foreign stock returns, including the Nikkei 225 Stock Average, Morgan Stanley Japan, and Morgan Stanley European Australian Far East indexes.

Bargaining Power, Strike Duration, and Wage Outcomes: An Analysis of Strikes in the 1880s

David Card and **Craig A. Olson**
NBER Working Paper No. 4075
May 1992
JEL Nos. N31, J50
Development of the American Economy, Labor Studies

We study strike durations and outcomes for some 2000 disputes that occurred between 1881 and 1886. Most post-strike bargaining settlements in the 1880s fell

into one of two categories: either a union "victory," characterized by a significant wage gain or hours cut, or a union "defeat," characterized by the resumption of work at the previous terms of employment. We find a strong negative relationship between strike duration and the value of the settlement to workers, reflecting the declining probability of a union victory in strikes of longer duration. For the subset of strikes over wage increases, we calculate a simple index of employees' relative bargaining power, based on the relative time to a union capitulation. We find that employees' relative bargaining power was higher in disputes involving fewer workers and in union-ordered strikes, but substantially lower after the Haymarket Square incident in Chicago in 1886.

Government Solvency, Ponzi Finance, and the Redundancy and Usefulness of Public Debt

Willem H. Buiter and **Kenneth M. Kletzer**
NBER Working Paper No. 4076
May 1992
Public Economics

We investigate how the ability of the government to depart from budget balance and to issue debt expands the set of equilibriums that can be supported by lump-sum-tax-transfer instruments. We show how this depends on the restrictions on the capacity to tax and make transfer payments, and what these restrictions imply for the government's ability to issue debt.

Central to our analysis is the definition of solvency for an infinite-lived government in an infinite-lived economy with overlapping generations of finite-lived households. Our specification is derived from the demand for public debt by private agents, and the nonnegativity constraints on the capital stock and on private consumption by all generations. With fairly tight restrictions on the government's tax-transfer menu, our solvency constraint implies the conventional solvency constraint.

With unrestricted taxes and transfers, Ponzi finance is always possible but "inessential": it does not expand the set of equilibriums that can be supported. Ponzi finance can be "essential" when taxes and transfers are restricted. We demonstrate how the government's ability to issue debt allows restricted tax-transfer schemes to support all equilibriums attainable using unrestricted taxes and transfers.

Russia and the Soviet Union Then and Now

Stanley Fischer
NBER Working Paper No. 4077
May 1992
JEL No. E00
Economic Fluctuations

This paper focuses on the process and progress of economic reform in Russia. I start with four historical questions that bear on the current situation: How advanced was Russia in 1913? What relevance, if any, does the New Economic Policy of the 1920s have for the current situation? Why did economic growth in the Soviet Union slow in the 1970s and 1980s? What role did Gorbachev's policies play in bringing about the final collapse of the Soviet Union?

Russia's approach to reform is similar to that of several other East European countries, but differs in having started with a major price liberalization, before macroeconomic stabilization was assured. I examine the close links between macroeconomic stabilization and enterprise restructuring that have emerged in the Russian political process, and analyze the need for an explicit industrial restructuring policy that goes beyond privatization. Finally, I discuss the interrelated questions of interrepublican trade, payments, and new currencies.

Optimal Sanctions When the Probability of Apprehension Varies Among Individuals

Lucian Arye Bebchuk and **Louis Kaplow**
NBER Working Paper No. 4078
May 1992
JEL No. K42
Law and Economics

This paper explores how optimal enforcement is affected by the fact that individuals are not equally easy to apprehend. If the probability of apprehension is the same for all individuals, then optimal sanctions will be maximal; as Gary Becker (1968) suggested, raising sanctions and reducing the probability of apprehension saves enforcement resources. This argument necessarily holds only when the enforcement authority knows before expending any investigative resources how difficult an individual will be to apprehend. When differences among individuals exist and can be observed only after apprehension, or not at all, then optimal enforcement may involve less than maximal sanctions.

Optimal Sanctions When Individuals Are Imperfectly Informed About the Probability of Apprehension

Lucian Arye Bebchuk and **Louis Kaplow**
NBER Working Paper No. 4079
May 1992
JEL No. K42
Law and Economics

This paper considers optimal enforcement when individuals have imperfect information about the probability of apprehension. If individuals are perfectly informed, then optimal sanctions are maximal; as Gary Becker (1968) suggested, society can economize on enforcement resources by reducing the probability of apprehension while increasing sanctions. But when individuals observe the probability of apprehension imperfectly, lower sanctions may be optimal along with more enforcement resources.

Economic Exchange and Support Within U.S. Families

Laurence J. Kotlikoff
NBER Working Paper No. 4080
May 1992
JEL No. J1
Aging

This paper examines levels and trends in U.S. family exchange and support. Demographics and geographic mobility are seen as important to the amount and form of family exchange. Family economic exchange may be in the form of shared living, financial transfers, or the provision of time. The paper also describes recent tests of family altruism and risk sharing.

The resultant picture is very pessimistic. Demographic, geographic, and economic pressures have taken their toll on U.S. families in recent years. While many Americans are members of extended families that are intact and in touch, a growing number of Americans have few extended family members on whom to rely. Family support in the form of shared living, financial assistance, and significant provision of time increasingly is becoming the exception, rather than the rule. Family economic assistance still appears to be available for many Americans in the case of dire emergencies, but at other times Americans increasingly are left to fend for themselves.

Innovation, Imitation, and Intellectual Property Rights

Elhanan Helpman
NBER Working Paper No. 4081
May 1992
JEL No. F1
International Trade and Investment

This paper examines the debate between the North and the South about the enforcement of intellectual property rights in the South when the North innovates products and the South imitates them. To evaluate the welfare effect of a policy of tighter intellectual property rights, I decompose a region's welfare change into four factors: terms of trade; production composition; available product choice; and intertemporal allocation of consumption spending. Finally, I consider the role of foreign direct investment.

Central Bank Behavior and the Strategy of Monetary Policy: Observations from Six Industrialized Countries

Ben S. Bernanke and **Frederic S. Mishkin**
NBER Working Paper No. 4082
May 1992
Economic Fluctuations, Monetary Economics

This paper compares the conduct and performance of monetary policy in six industrialized countries after the breakup of the Bretton Woods system. From a positive perspective, we find that central banks adopt money growth targets when inflation threatens to get out of control. Central banks appear to use money growth targets both as guideposts for assessing the stance of policy and as a means of signaling their intentions to the public. However, no central bank adheres strictly to targets in the short run.

Money growth targets might be useful in providing a medium-term framework for monetary policy, if the targeting is done in a clear and straightforward manner and if targets can be adjusted for changes in the link between target and goal variables. It appears that rigid adherence to money growth targets in the short run is not necessary to gain some benefits of targeting, as long as there is some commitment by the central bank to reverse short-term deviations from target ultimately. Finally, the choice of operating procedure seems to have little bearing on the success of policy.

The Present-Value Model of Rational Commodity Pricing

Robert S. Pindyck
NBER Working Paper No. 4083
May 1992
JEL Nos. G12, G13
Asset Pricing

The present-value model relates an asset's price to the sum of its discounted expected future payoffs. I explore the limits of the model by testing its ability to explain the pricing of storable commodities. For commodities, the payoff stream is the convenience yield that accrues from holding inventories, and it can be measured directly from spot and futures prices. Hence the model imposes restrictions on the joint dynamics of spot and futures prices. I find close conformance to the model for heating oil, but not for copper or lumber, and especially not for gold. The pattern is the same for the serial dependence of excess returns. These results suggest that for three of the four commodities, prices deviate from fundamentals at least temporarily.

Risk Management: Coordinating Corporate Investment and Financing Policies

Kenneth A. Froot, David S. Scharfstein, and **Jeremy C. Stein**
NBER Working Paper No. 4084
May 1992
JEL Nos. G32, G31
Corporate Finance,
International Finance and Macroeconomics

We develop a general framework for analyzing corporate risk management policies. If external sources of finance are more costly to corporations than internally generated funds are, then there will be a benefit to hedging: hedging adds value, to the extent that it helps ensure that a corporation has sufficient internal funds available to take advantage of attractive investment opportunities.

We argue that this simple observation has wide-ranging implications for the design of risk management strategies. We delineate how these strategies should depend on such factors as shocks to investment and financing opportunities. We also discuss exchange rate hedging strategies for multinationals, as well as strategies involving "nonlinear" instruments, including options.

Cross-Country Patterns of Change in Relative Wages

Steven J. Davis
NBER Working Paper No. 4085
June 1992
JEL Nos. D31, J31
Economic Fluctuations, Labor Studies

This paper investigates movements in relative wages and wage inequality across 13 of the world's major economies. Focusing on the wages of full-time male workers, I find that: 1) Most advanced industrialized economies had increases, often large, in wage inequality during the 1980s; none had declining wage inequality. In contrast, three of four middle-income countries had sharply declining wage inequality during the 1980s. 2) Since the early to late 1970s, the advanced economies have seen large and persistent increases in the wages of prime-age men relative to the wages of less experienced men. 3) Following a period of sharply declining education differentials in the 1970s, the advanced economies had rising or flat education differentials after 1980. Education differentials fell moderately to sharply in the middle-income countries during the 1980s. 4) Wage inequality among observationally similar workers rose sharply during the 1980s in most advanced economies. 5) After 1975, the structure of relative industry wages in the manufacturing sector became increasingly dissimilar across the advanced economies. However, controlling for common time effects, increases in international trade as a fraction of GDP are associated with a partial convergence of relative industry wage structures across countries.

The International Transmission of Tax Policies in a Dynamic World Economy

Marcelo Bianconi and **Stephen J. Turnovsky**
NBER Working Paper No. 4086
June 1992
JEL Nos. F42, H87
International Trade and Investment

This paper analyzes the international transmission of tax shocks in a two-country, infinite-horizon, representative-agent framework. In analyzing such shocks, we emphasize the viability of the underlying tax regimes, which arise from the arbitrage conditions characterizing equilibrium in a perfect world capital market. We derive conditions for both short- and long-run viability, and discuss the two polar regimes of source- and residence-based taxation. In general, we find the former more likely to satisfy the viability conditions than the latter. With equity financing, the long-run viability of residence-based taxation is likely to require the harmonization of tax and/or dividend policy.

Labor Market Segmentation Theory: Reconsidering the Evidence

William T. Dickens and **Kevin Lang**
NBER Working Paper No. 4087
June 1992
JEL No. J20
Labor Studies

We argue that labor market segmentation theory is a good alternative to standard views of the labor market. It is internally consistent and is based on plausible assumptions about behavior and technology. More significantly, many of its predictions have been tested and confirmed. Further, the theory has done quite well dynamically: when it has suggested new tests, more often than not its predictions have been validated. Labor market segmentation theory, unlike human capital theory, has required few post-hoc rationalizations to explain a large and growing body of empirical work. Finally, we argue that further exploration of the implications of the theory for unemployment, trade, industrial policy, and income distribution will provide useful insights and further tests of the theory.

Asset Pricing Explorations for Macroeconomics

John H. Cochrane and **Lars Peter Hansen**
NBER Working Paper No. 4088
June 1992
Asset Pricing, Economic Fluctuations

We argue that financial data are a useful proving ground for macroeconomic models, and we explore the channels that link asset market data to such models. Using Hansen and Jagannathan's bounds on the mean and standard deviation of discount factors, we survey several asset pricing puzzles. We then extend the bounds to reflect the correlation of discount factors with asset returns and to characterize conditional moments of discount factors. These characterizations help us to understand the behavior of a variety of models studied in the literature. We also incorporate borrowing constraints into the calculations. These constraints loosen the required properties of aggregate measurements of intertemporal marginal rates of substitution, but also sharpen the implications of asset market data for the marginal rates of substitution of unconstrained individuals.

Asymmetric Pricing Adjustment and Economic Fluctuations

Laurence M. Ball and **N. Gregory Mankiw**
NBER Working Paper No. 4089
June 1992
Economic Fluctuations, Monetary Economics

We present a menu-cost model in which positive trend inflation causes firms' relative prices to decline au-

tomatically between price adjustments. In this environment, shocks that raise firms' desired prices trigger larger price responses than shocks that lower desired prices. We use this model of asymmetric adjustment to address three issues in macroeconomics: the effects of aggregate demand; the effects of sectoral shocks; and the optimal rate of inflation.

Microeconomic Adjustment Hazards and Aggregate Dynamics

Ricardo J. Caballero and **Eduardo M. R. A. Engel**
NBER Working Paper No. 4090
June 1992
JEL Nos. E20, E24, C40, C43
Economic Fluctuations

The basic premise of this paper is that understanding aggregate dynamics requires considering that agents are heterogeneous and do not adjust continuously to the shocks they perceive. We characterize lumpy behavior at the microeconomic level in terms of an *adjustment hazard function* that relates the probability that a unit adjusts to the deviation of its state variable from what would be its optimal level if frictions were removed momentarily. We argue that adjustment hazards that eventually are increasing with respect to the magnitude of this deviation are likely. This allows for testable restrictions and a simple comparison with the partial adjustment model, which corresponds to the constant hazard case. We show how nonconstant hazards—in particular, increasing hazards—generate nonlinearities and history dependence in *aggregate* equations. We present an example based on U.S. manufacturing employment and job flows and find that increasing hazard models outperform partial adjustment models in describing aggregate employment dynamics. The improvement is most notorious during deep recessions and brisk expansions.

Price Rigidities, Asymmetries, and Output Fluctuations

Ricardo J. Caballero and **Eduardo M. R. A. Engel**
NBER Working Paper No. 4091
June 1992
JEL Nos. E30, E32
Economic Fluctuations

In an economy in which individual firms follow state-dependent pricing rules, we find that the average response of output to aggregate demand shocks decreases with core inflation and varies with aggregate uncertainly. There is an asymmetry in the response of output to aggregate demand expansions and contractions, which increases with core inflation and decreases with aggregate uncertainty. This asymmetry also rises with the degree of asymmetry of aggregate demand shocks. Annual data from 37 moderate-to-low inflation countries for 1960–82 support the basic implications of our model.

Ownership Structure and Corporate Performance in Japan

Frank R. Lichtenberg and **George M. Pushner**
NBER Working Paper No. 4092
June 1992
JEL No. G32
Corporate Finance

We test several hypotheses regarding the relationship between ownership structure and corporate performance. We find that equity ownership by financial institutions in Japan may substitute effectively for the missing external takeover market by resulting in monitoring and intervention that minimizes the danger of lapses in productivity. In contrast, we also find that high levels of intercorporate shareholding insulate firms from their problems at the expense of firm performance. Further, we find that insider ownership has a notable positive influence, but that the influence of financial institutions has not diminished in the globalization and prosperity of the 1930s.

Risk Sharing, Global Diversification, and Growth

Maurice Obstfeld
NBER Working Paper No. 4093
June 1992
JEL Nos. O40, G15
Growth

I develop a dynamic continuous-time model in which international risk sharing can yield substantial welfare gains through its positive effect on expected growth of consumption. The mechanism linking global diversification to growth is an attendant shift in the world portfolio from safe, but low-yield capital into riskier, high-yield capital. The presence of these two types of capital captures the idea that growth depends on the availability of an ever-increasing array of specialized, and hence inherently risky, production inputs. A partial calibration of the model with consumption data from the Penn World Table implies steady-state welfare gains from global financial integration that, for some regions, amount to several times initial wealth.

International Adjustment with Habit-Forming Consumption: A Diagrammatic Exposition

Maurice Obstfeld
NBER Working Paper No. 4094
June 1992
JEL Nos. F32, D91
International Trade and Investment

This paper presents a simple diagrammatic analysis of an open economy's external adjustment process un-

der habit-forming individual preferences. I focus on the consumption side and aim to illustrate the linkage among wealth, past consumption experience, and current consumption. I also extend the standard representative-agent model to a growing economy of overlapping generations. Under habit formation, an agent's consumption exhibits a form of hysteresis, in that current consumption depends on past consumption and initial assets. In the overlapping-generations model, aggregate hysteresis disappears in the long run.

Sequencing and Welfare: Labor Markets and Agriculture

Sebastian Edwards
NBER Working Paper No. 4095
June 1992
JEL Nos. F0, F4
International Trade and Investment

Recent discussions on structural adjustment and market-oriented reforms in developing and Eastern European nations have addressed the issue of appropriate sequencing. Most traditional work on the subject concludes that the first step in preferred sequencing should be opening up the trade account. This "trade account first" literature, however, has been mostly macroeconomic in nature, without explicitly exploring the microeconomics and welfare consequences of alternative sequencing strategies.

In this paper, I develop a formal intertemporal model to investigate the welfare effects of different reform sequences. More specifically, I analyze whether the "trade account first" recommendation can be backed theoretically by welfare considerations. I focus on the role of labor market distortions and on the agricultural sector, I find that there are very weak *welfare-based* arguments in favor of "trade account first." I also find that an early reform of the labor market generally will improve welfare.

Investment and Research and Development at the Firm Level: Does the Source of Financing Matter?

Sebastian Edwards
NBER Working Paper No. 4096
June 1992
JEL Nos. G3, L0
Corporate Finance, Productivity

The elasticity of investment in general, and investment in R and D, with respect to cash flow is unambiguously positive in a large panel of U.S. manufacturing firms from 1973 to 1987, even with proper controls for permanent differences across firms and simultaneity. I argue that liquidity constraints, rather than just demand effects, cause this relationship. Also, I find that debt is not favored as a form of finance for R and D–intensive firms: leverage ratios and R and D investment are correlated strongly negatively across firms, and this is not explained by differences in corporate taxation. Finally, the contemporaneous relationship between changes in debt levels and investment that I have documented previously (Hall 1990b and 1991) is one of simultaneity, and is apparently transitory, unlike the relationship between cash flow and investrnent.

The Economics of Bankruptcy Reform

Philippe Aghion, Oliver Hart, and **John Moore**
NBER Working Paper No. 4097
June 1992
Corporate Finance

We propose a new bankruptcy procedure: First, a firm's debts are canceled, and bids are solicited for the "new" (all equity) firm. Former claimants are given shares, or options to buy shares, in the new firm on the basis of absolute priority. Once the bids are in, these options are exercised. Finally, shareholders vote to select one of the bids.

In essence, our procedure is a variant of the U.S. Chapter 7, in which noncash bids are possible; this allows for reorganization. We believe our scheme is superior to Chapter 11 because it is simpler, quicker, market-based, avoids conflicts, and places appropriate discipline on management.

International Comparisons of Pricing-to-Market Behavior

Michael M. Knetter
NBER Working Paper No. 4098
June 1992
JEL Nos. F14, L16, L60
International Trade and Investment

This paper measures the degree of price discrimination across export destinations that is associated with exchange rate changes, I use U.S., U.K., German, and Japanese industry-level data. Given the industries sampled, I observe more price discrimination across destinations in the U.K., German, and Japanese data. For industries that match across source countries, however, behavior is very similar across countries. Furthermore, destination-specific price adjustment on exports to the United States from Germany and Japan is similar to price adjustment on shipments to other destinations. Most of the variation in the data appears to be related to industry.

The Meaning of College in the Lives of American Women: The Past One Hundred Years

Claudia Goldin
NBER Working Paper No. 4099
June 1992
JEL Nos. J24, J16, I21
Development of the American Economy, Labor Studies

I consider three groups of college women: the first, graduating from 1900 to 1920, faced a choice of "family or career"; the second, graduating from 1945 to the early 1960s, opted for "family then job"; the third, graduating since 1980 in a climate of greater gender equality, is attempting both "family and career" with mixed results and considerable frustration. I assess the reasons for the changing set of trade-offs faced by each generation of college women, and why the college education of women expanded after World War II.

The 1900–20 graduates attended college when the numbers of men and women in college were about equal. The 1945–60 group attended college when the proportion of male undergraduates was at an all-time high. For this group, only half of the return to college came in the form of a B.A. degree; the other half came from an "M.R.S." Ironically, because the total return to college—from the B.A. and the M.R.S.—was quite high, enrollments of women expanded rapidly and eventually gave rise to a demand for greater gender equality in the labor market and society.

Autos and the National Industrial Recovery Act: Evidence on Industry Complementarities

Russell Cooper and **John C. Haltiwanger**
NBER Working Paper No. 4100
June 1992
Economic Fluctuations

This paper investigates the motivations for, and implications of, the automobile industry code under the National Industrial Recovery Act (NIRA). The amended code contained a provision calling for automobile producers to alter the timing of new model introductions and the annual automobile show in order to regularize employment in the industry.

After documenting key features of the automobile industry during the1920s and 1930s and outlining the provisions of the automobile code, we analyze two models of the annual automobile cycle. In one model, NIRA simply codified a change in industry behavior that would have taken place anyway because of a change in *fundamentals* in the economy during the early 1930s. The other model introduces a *coordination problem* into the determination of the equilibrium timing of new model introductions. We provide evidence against the hypothesis that changes in fundamentals led to the dramatic changes in the seasonal pattern of production and sales starting in 1935. Instead, it appears that NIRA succeeded in coordinating activity on an alternative equilibrium.

Hostile Takeovers and Expropriation of Extramarginal Wages: A Test

David Neumark and **Steven A. Sharpe**
NBER Working Paper No. 4101
June 1992
JEL Nos. D21, G34, J24, J26, J33, J41
Labor Studies

We construct a model to test the hypothesis that firms with employees earning extramarginal wages-—perhaps because of long-term implicit contracts—were more likely to experience hostile tender offers from 1979–89. We focus on firms on the Compustat (active) file in 1979. We use the 1980 Census of Population to estimate wage equations by two-digit (SIC) industry and to extract both industry wage premiums and age–earnings profiles and age distributions of employees by industry. We then construct firm-level estimates of employee characteristics using the Compustat breakdown of firm sales by industry segment. Finally, we estimate event probabilities and find that variables related to the magnitude of extramarginal wage payments, plus other firm-characteristics, including the extent of diversification across industries, raise the likelihood of being a hostile takeover target, relative to other corporate events.

Foreign Direct Investment as a Commitment Mechanism in the Presence of Managed Trade

Joshua Aizenman
NBER Working Paper No. 4102
June 1992
JEL Nos. F21, F12, F13
International Trade and Investment

This paper evaluates the degree to which the threat of managed trade leads to foreign direct investment (FDI). I study the role of capital mobility in a two-country world economy characterized by monopolistic competition. Investment decisions are implemented ex ante, prior to productivity shocks. International trade among the countries is the outcome of either free or managed trade. A switch from free to managed trade may occur, ex post, as the result of a cost–benefit assessment by the two countries. Under managed trade, the patterns of international commerce are the outcome of costly bargaining.

I identify time-inconsistent patterns of managed trade in the absence of capital mobility. Ex post, one country will have the incentive to induce a switch to managed trade, which will reduce expected welfare ex ante. I show that capital mobility, and the diversification of production achieved by FDI, alleviates this time inconsistency by reducing (and potentially eliminating) the ex post incentive of one country to switch to managed trade. FDI induced by the threat of managed trade thus benefits ex ante both the host country and the multinationals, which explains the relative tolerance toward FDI.

Inflation and Social Welfare in a Model with Endogenous Financial Adaptation

Federico Sturzenegger
NBER Working Paper No. 4103
June 1992
JEL Nos. F41, E31
International Finance and Macroeconomics

I develop a model with endogenous financial adaptation. With a representative agent, inflation and welfare increase upon introduction of financial adaptation. Once I allow for agents' heterogeneity, I can show that inflation still increases and that the "poor" are hurt, while the "rich" benefit from the process of financial adaptation. Finally, I consider the optimal level of seigniorage collection. With a representative agent, financial adaptation increases both the optimal level of government spending and the inflation rate. With heterogeneous agents, if the government cares for the low-income group, the optimal amount of government spending falls, even though the rate of inflation increases. The model explains many stylized facts of high-inflation economies and the incentives behind many policy actions.

Time Nonseparability in Aggregate Consumption: International Evidence

Phillip A. Braun, George M. Constantinides, and **Wayne E. Ferson**
NBER Working Paper No. 4104
June 1992
JEL Nos. G12, G15
Asset Pricing

Using quarterly consumption and asset return data for six countries, we study consumption-based asset pricing models that allow for habit persistence and the durability of consumption goods. We estimate the parameters representing habit persistence or durability, risk aversion, and time preference for each of the countries. We find that time-nonseparable preferences improve the fit of the model. When the nonseparability parameter is statistically significant, its magnitude indicates that the effect of habit persistence dominates the effect of durability in consumption expenditures. However, the international evidence for habit persistence is weaker than it is for the United States. The results indicate that the simple model of time nonseparability does not provide a satisfactory explanation of consumption and asset returns.

Output Fluctuations at the Plant Level

Timothy F. Bresnahan and **Valerie A. Ramey**
NBER Working Paper No. 4105
June 1992
JEL Nos. E23, E32, D24
Economic Fluctuations

We study weekly output fluctuations from 1972 to 1983 at 50 final automobile assembly plants, using a new dataset with detalled information on plant operations. Our main findings are: 1) Even at the simplest fabrication and assembly plant, there are a variety of margins on which production quantities are adjusted. 2) The production adjustment margins have very different dynamic characteristics. 3) The analysis of plant-level data can lead to conclusions that are dramatically different from those reached using aggregated data, even though the data are driven by industrywide shocks.

Male Jobs, Female Jobs, and Gender Gaps in Benefits Coverage

Richard Chaykowski and **Janet Currie**
NBER Working Paper No. 4106
June 1992
JEL Nos. J32, J71
Labor Studies

Using contract-level data from Ontario, we show that workers in predominantly female bargaining units have more generous leave provisions, but are less likely to have pension coverage, than workers in similar predominantly male bargaining units. These differences persist even when we control for wages in the bargaining unit. Using a large cross section of individual-level data, we show that lack of pension coverage for women is explained by gender gaps in wages and tenure associated with marriage and childbearing. We then ask how consistent these findings are with two alternative models of sex segregation: labor market discrimination, or segregation arising because women bear the chief responsibility for household production and tend to hold jobs compatible with that role.

Forecasting Nursing Home Utilization of Elderly Americans

Andrew Dick, Alan M. Garber, and **Thomas E. MaCurdy**
NBER Working Paper No. 4107
June 1992
JEL Nos. I11, J14
Aging, Health Economics

Largely because the available data are inadequate, remarkably little is known about the amount of time that an elderly American can expect to spend in a nursing home. We infer the patterns and duration of nursing home stays of representative men and women at age 65. Using data from the 1982 and 1984 National Long-Term Care Survey and the 1985 National Nursing Home Survey, we estimate that the probability that a 65-year-old will ever enter a nursing home is 35 percent. Most nursing home stays are brief, but the few people who have long stays account for most of the utilization: the 90th percentile of nursing home utilization is nearly six years for men and more than eight years for women. The median utilization for those admitted to nursing homes is only six months. The modest but nonnegligible risk that institutionalization will last for years indicates that there may be an important role for insurance for catastrophic nursing home expenditures.

Financial Market Efficiency Tests

Tim Bollerslev and **Robert J. Hodrick**
NBER Working Paper No. 4108
June 1992
JEL No. G12
Asset Pricing

This paper surveys the literature on tests for market efficiency. We discuss standard autocorrelation tests, multiperiod regression tests, and volatility tests. We also consider the formulation and estimation of models for time-varying volatility. We calculate all of the reported test statistics and model estimates with monthly data on value-weighted NYSE stock prices and dividends. In addition to the standard constant discount rate present-value model, we postulate and simulate a new fundamental price relationship that accounts for the time-varying uncertainty in the monthly dividend growth rates. This results in a simulated fundamental price series that is broadly consistent with most of the sample statistics of the actual data.

Race and School Quality since *Brown vs. Board of Education*

Michael A. Boozer, Alan B. Krueger, and **Shari Wolkon**
NBER Working Paper No. 4109
June 1992
JEL No. J70
Labor Studies

This paper presents evidence on the quality of schooling by race and ethnic origin in the United States. Although substantial racial segregation exists across schools, the average pupil–teacher ratio is approximately the same for black and white students. Hispanics, however, have on average 10 percent more students per teacher than other racial groups. Relative to whites, blacks and Hispanics also are less likely to use computers at school and at work. We examine the implications of these differences in school quality for labor market outcomes. We conclude by examining reasons for the increase in the black–white earnings gap since the mid-1970s.

Exact Solutions for Expected Rates of Return Under Markov Regime Switching: Implications for the Equity Premium Puzzle

Andrew B. Abel
NBER Working Paper No. 4110
June 1992
JEL No. G12
Asset Pricing

This paper derives simple closed-form solutions for expected rates of return on stocks and riskless one-period bills under the assumption that shocks to the growth rates of consumption and dividends are generated by a Markov regime-switching process. I use these closed-form solutions to show that the Markov process exacerbates the equity premium puzzle and the risk-free rate puzzle. Three empirical examples illustrate the magnitude of the effects of Markov regime switching on equilibrium expected returns.

Empirical Evidence for Collusion in the U.S. Auto Market

Val Eugene Lambson and **J. David Richardson**
NBER Working Paper No. 4111
June 1992
JEL No. F1
International Trade and Investment

We calibrate a model of collusion to data from the North American passenger car market before, during, and after the voluntary restraint arrangements (VRAs) with Japan. Conclusions about whether the model is consistent with the data from the various regimes depend on assumptions about market structure, demand elasticities, and discount factors. If the price elasticity of auto demand is approximately one, for example, then the calibrations suggest that in the pre-VRA and VRA regimes, only General Motors and Ford conceivably could have colluded, and even this limited potential broke down in the post-VRA regime.

Making Sense of the Soviet Trade Shock in Eastern Europe: A Framework and Some Estimates

Dani Rodrik
NBER Working Paper No. 4112
June 1992
JEL Nos. F13, F4, P33
International Trade and Investment

Eastern European countries have experienced sharp declines in real GDP since 1990. One of the reasons for these declines is the Soviet trade shock, caused by the collapse of the CMEA and of traditional export markets in the Soviet Union. This paper attempts to quantify the magnitude of this external shock.

The shock has three distinct elements: 1) a terms-of-trade deterioration; 2) a market loss effect; and 3) a removal of import subsidy effect. Taking all three together, and adding Keynesian multiplier effects, I conclude that the Soviet trade shock explains all of the decline in GDP in Hungary, about 60 percent of the decline in Czechoslovakia, and between one-quarter and one-third of the decline in Poland.

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