

Performance Pay and Productivity

Edward P. Lazear

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JEL Nos. J00, J33

Labor Studies, Productivity

What happens when a firm switches from paying hourly wages to paying piece rates? The theory I develop predicts that average productivity rises, that the firm will attract a more able work force, and that the variance in output across individuals at the firm will rise as well. I test the theory with data from a large autoglass company that changed compensation structures between 1994 and 1995. All my theoretical predictions are borne out. In the firm I examine, the productivity effects are extremely large, amounting to anywhere from about 20 percent to 36 percent of output, depending on what factors are held constant. About half of the worker-specific increase in productivity is passed on to workers in the form of higher wages.

The Effects of the Corporate Average Fuel Efficiency Standards

Pinelopi K. Goldberg

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JEL Nos. F1, H2, K2, L5

This paper examines the effects of the Corporate Average Fuel Efficiency standards (CAFE) on the automobile product mix, prices, and fuel consumption. To this end, first I estimate a discrete-choice model of automobile demand and a continuous model of vehicle utilization using microdata from the Consumer Expenditure Survey for 1984-90. Next, I combine the demand side model with a model of oligopoly and product differentiation on the supply side. After estimating the demand and supply parameters, I

assess the effects of the CAFE regulation through simulations, and compare them to the effects of alternative policy instruments, such as a powerful gas guzzler tax and an increase in the gasoline tax.

I find that vehicle utilization in the short run is unresponsive to changes in fuel cost; vehicle purchases, however, respond to both car prices and fuel cost. Taken together, these results imply that: 1) contrary to the claims of CAFE opponents, higher fleet fuel efficiency is not neutralized by increased driving; and 2) policies aiming at reducing fuel consumption by shifting the composition of the fleet toward more fuel-efficient vehicles are more promising than policies that target utilization. Policies with such compositional effects operate through two channels: changes in vehicle prices and changes in operating costs. Contrary to the claims of environmental groups, my results do not indicate the existence of consumer "myopia." Nonetheless, I find that the gasoline tax increase necessary to achieve fuel consumption reductions equivalent to the ones currently achieved through CAFE is 780 percent; whether an increase of this magnitude is currently politically feasible is questionable. In general, I find that the CAFE regulation was effective in reducing fuel consumption; however, shifts in the classification of products as domestic versus imports may have weakened the effectiveness of the standards.

Elephants

Michael Kremer and Charles Morcom

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JEL Nos. D90, Q20, Q22

Economic Fluctuations and Growth

Existing models of open-access resources are applicable to nonstorable resources, such as fish. How-

ever, many open-access resources are used to produce storable goods. Elephants, rhinos, and tigers are three prominent examples. Anticipated future scarcity of these resources will increase current prices, and current poaching. This implies that, for given initial conditions, there may be rational expectations equilibriums leading both to extinction and to survival. Governments may be able to eliminate extinction equilibriums by promising to implement tough antipoaching measures if the population falls below a threshold. Alternatively they, or private agents, may be able to eliminate extinction equilibriums by accumulating a sufficient stockpile of the storable good.

Forecasting Exchange Rates and Relative Prices with the Hamburger Standard: Is What You Want What You Get with McParity?

Robert E. Cumby

NBER Working Paper No. 5675

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JEL Nos. F31, F30

International Finance and Macroeconomics

A decade ago the *Economist* began an annual survey of Big Mac prices as a guide to "whether currencies are trading at the right exchange rates." This paper asks how well the hamburger standard has performed. Although average deviations from absolute Big Mac parity are large for several currencies, once estimates of these average deviations are removed from the data, the evidence suggests that convergence to relative Big Mac parity is quite rapid. The half-life of deviations from Big Mac parity appear to be about one year, which is considerably shorter than estimates of the half-life of deviations from purchasing power parity (four to five years) that are reported in the literature. In

addition, deviations from relative Big Mac parity appear to provide useful information for forecasting exchange rates. After accounting for currency-specific constants, a 10 percent undervaluation according to the hamburger standard in one year is associated with a 3.5 percent appreciation over the following year. Finally, deviations from relative Big Mac parity seem to be helpful in forecasting relative local currency prices. When the U.S. dollar price of Big Macs is high in a country, the relative local currency price of Big Macs in that country is likely to fall during the following year.

Relative Labor Productivity and the Real Exchange Rate in the Long Run: Evidence for a Panel of OECD Countries

**Matthew B. Canzoneri,
Robert E. Cumby, and
Behzad Diba**

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International Finance and
Macroeconomics

The Balassa-Samuelson model, which explains real exchange rate movements in terms of sectoral productivities, rests on two components. First, for a class of technologies including Cobb-Douglas, the model implies that the relative price of non-traded goods in each country should reflect the relative productivity of labor in the traded and nontraded goods sectors. Second, the model assumes that purchasing power parity (PPP) holds for traded goods in the long run. We test each of these implications using data from a panel of OECD countries. Our results suggest that the first of these two fits the data quite well. In the long run, relative prices generally reflect relative labor productivities. The evidence on PPP in traded goods is consider-

ably less favorable. When we look at U.S. dollar exchange rates, PPP does not appear to hold for traded goods, even in the long run. On the other hand, when we look at Deutsche-mark exchange rates, PPP appears to be a somewhat better characterization of traded goods prices.

Demographic Structure and the Political Economy of Public Education

James M. Poterba

NBER Working Paper No. 5677
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JEL Nos. H42, H72, I22, J14
Aging, Public Economics

This paper examines the relationship between demographic structure and the level of government spending on grades K-12 education. Panel data for the U.S. states over 1960-90 suggests that an increase in the fraction of elderly residents in a jurisdiction is associated with a significant reduction in educational spending per child. This reduction is particularly large when the elderly residents and the school-age population are from different racial groups. Variation in the size of the school-age population does not result in proportionate changes in education spending, so students in states with larger school-age populations receive lower per-student spending than those in states with smaller numbers of potential students. These results support models of generational competition in the allocation of public sector resources. They also suggest that the effect of cohort size on government-mediated transfers must be considered in analyzing how cohort size affects economic wellbeing.

Money and Exchange Rates in the Grossman-Weiss-Rotemberg Model

**Fernando Alvarez and
Andrew Atkeson**

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JEL Nos. F31, F33
International Finance and
Macroeconomics

We examine the impact of monetary injections in the Grossman-Weiss-Rotemberg model. We show that monetary shocks can lead to nominal exchange rates that are much more volatile than inflation, money growth, or interest rate differentials. Moreover, movements in real exchange rates following monetary injections can be persistent and nearly as large as movements in nominal exchange rates.

Wage Subsidies for the Disadvantaged

Lawrence F. Katz

NBER Working Paper No. 5679
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Labor Studies

Wage subsidies to private employers often have been proposed by economists as a potentially flexible and efficient method for improving the earnings and employment of low-wage workers. This paper lays out the basic economics of wage subsidies; examines issues arising in the design of alternative forms of wage subsidies; and reviews evidence on the effectiveness of recent U.S. wage subsidy programs and demonstration projects. Wage subsidies to employers to hire disadvantaged workers appear to raise the demand for labor for those workers modestly. Stand-alone wage subsidies (or employment tax credits) that are highly targeted on very specific groups (for example, welfare recipients) appear to have low utilization rates and (in some cases) may stig-

matize the targeted group. But new evidence from 1979 to 1994 based on an examination of changes in eligibility rules for the Targeted Jobs Tax Credit—the major U.S. wage subsidy program for the economically disadvantaged—suggests that it had modest positive employment effects on economically disadvantaged young adults. Policies combining wage subsidies with job development, training, and assistance for job search appear to have been somewhat successful in improving the employment and earnings of specific targeted disadvantaged groups.

Implementing Results-Oriented Trade Policies: The Case of the U.S.–Japanese Auto Parts Dispute

Kala Krishna and John Morgan

NBER Working Paper No. 5680

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JEL Nos. F12, F13

International Trade and Investment

Why would the United States threaten punitive tariffs on luxury autos to implement a market share target in auto parts? We show that by making threats to a *linked* market, a market share target may be implemented with fairly weak informational and administrative requirements. Moreover, such policies can be both pro-competitive and advantageous to U.S. firms.

Contagious Currency Crises

**Barry Eichengreen,
Andrew K. Rose, and
Charles Wyplosz**

NBER Working Paper No. 5681

July 1996

JEL No. F31

International Finance and

Macroeconomics

This paper examines the fact that speculative attacks tend to be correlated temporally, that is, currency crises appear to pass “contagiously” from one country to another. The paper provides a survey of the theoretical literature, and empirically analyzes the contagious nature of currency crises. Using 30 years of panel data from 20 industrialized countries, we find evidence of contagion. Contagion appears to spread more easily to countries that are tied closely by international trade linkages than to countries in similar macroeconomic circumstances.

Optimal Money Burning: Theory and Application to Corporate Dividend Policy

**B. Douglas Bernheim and
Lee Redding**

NBER Working Paper No. 5682

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JEL Nos. H32, G35

Public Economics

We explore signaling behavior in settings with a discriminating signal and several costly nondiscriminating (“money burning”) activities. In settings in which informed parties have many options for burning money, existing theory provides no basis for selecting one nondiscriminating activity over another. When senders have private information about the costs of these activities, each sender’s indifference is resolved; the taxation of a nondiscriminating signal is Pareto-improving; and the use of the taxed activity becomes more widespread as the tax rate rises. We apply this analysis to the theory of dividend signaling. We verify empirically the central testable implication of the model.

Tax Policy and Investment

**Kevin A. Hassett and
R. Glenn Hubbard**

NBER Working Paper No. 5683

July 1996

JEL No. H3

Public Economics,

Economic Fluctuations and Growth

In this paper, we summarize recent advances in the study of the effects of tax policy on the fixed investment decisions of firms. We attempt to identify consensus where it has been achieved, and to highlight important unresolved issues. In addition, we discuss the implications of recent findings for the analysis of policy options, and discuss arguments for and against long-run tax policy that favors business investment spending.

Control of the Public Debt: A Requirement for Price Stability?

Michael Woodford

NBER Working Paper No. 5684

July 1996

Economic Fluctuations and Growth,

Monetary Economics

This paper considers the role of limits on the permissible growth of public debt, such as those stipulated in the Maastricht treaty, in making price stability possible. I show that a certain type of fiscal instability, specifically variations in the present value of current and future primary government budgets, necessarily results in price level instability, in the sense that there is no monetary policy that will result in an equilibrium with stable prices. In the presence of sluggish price adjustment, the fiscal shocks disturb real output and real interest rates as well.

On the other hand, shocks of this kind can be eliminated by a Maastricht-type limit on the value of the public debt. In the presence of the debt limit (and under assump-

tions of frictionless financial markets, and so forth), "Ricardian equivalence" holds, and fiscal shocks have no effect on real or nominal variables. Further, an appropriate monetary policy rule can ensure price stability even in the face of other types of real shocks. Thus the debt limit serves as a precondition for the common central bank in a monetary union to have responsibility for maintaining a stable value for the common currency.

Demand Shifts, Population Adjustments, and Labor Market Outcomes During the 1980s

John Bound and Harry J. Holzer

NBER Working Paper No. 5685

July 1996

JEL Nos. J31, J61

Labor Studies

We explore the effects of shifts in labor demand and population adjustments across metropolitan areas on the employment and earnings of various demographic groups during the 1980s. We show that, although earnings and employment deteriorated for less-educated and black males in most areas in the 1980s, there was a good deal of geographic variation in the magnitudes of these changes. Shifts in labor demand across local areas contributed to this variation, and had greater relative impacts on the earnings and employment of these demographic groups. We also find that population shifts across areas, presumably attributable to migration, at least partially offset the effects of these shifts in demand. However, less-educated workers adjusted substantially less in response to these shifts in demand. Their limited supply responses apparently contributed quite a bit to the relatively greater deterioration of employment and earnings among these groups in the declining geographic areas during the 1980s.

Assessing the Effectiveness of Saving Incentives

R. Glenn Hubbard and Jonathan S. Skinner

NBER Working Paper No. 5686

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JEL Nos. E2, H3

Public Economics

In this paper, we argue that there is more to be learned from recent research on the effectiveness of targeted saving incentives than the wide variation in empirical estimates suggests. First, characterizations of "all new saving" or "no new saving" are extreme; IRAs and 401(k) plans appear to stimulate moderate amounts of new saving. Second, taking a cost-benefit approach might involve asking: What is the incremental gain in capital accumulation per dollar of foregone revenue? We find that for quite conservative measures of the saving impacts of IRAs or 401(k)s, the incremental gains in capital accumulation per dollar of lost revenue are large.

Deregulation and Labor Earnings in the Airline Industry

David Card

NBER Working Paper No. 5687

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JEL No. J4

Labor Studies

This paper uses a variety of data sources to study the effect of deregulation on the structure of wages in the airline industry. Microdata from the 1980 and 1990 Censuses show a 10 percent decline in the relative earnings of airline workers after deregulation, with roughly similar declines for industry-specific occupations (pilots and flight attendants) and general occupations (managers and secretaries). Union contract data for pilots, flight attendants, and mechanics at the major firms show similar trends in the levels of earnings, along with a rise in interfirm

wage inequality, especially for pilots. Finally, data from the displaced worker surveys reveal that airline workers experienced similar wage losses to those who lost jobs in other industries over the 1980s. Taken as a whole, the evidence suggests that the rent premiums earned by airline workers in the regulatory era were relatively modest, and were comparable to the wage premiums earned in many other sectors.

The Economic Consequences of Parental Leave Mandates: Lessons from Europe

Christopher J. Ruhm

NBER Working Paper No. 5688

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JEL No. J38

Health Care, Labor Studies,

Public Economics

This study investigates the economic consequences of parental leave mandates, using data for 16 European countries over 1969 through 1988. Since women use virtually all of the family leave in most nations, men constitute a reasonable comparison group. The natural experiment in most of the analysis involves examining how changes in entitlements to leave affect the gap between female and male labor market outcomes. I also compare the employment-to-populations ratios of women in their prime childbearing years to those of older females, as a function of changes in leave regulations. Parental leave mandates are associated with increases in total employment, but appear to have a more modest effect on weekly work hours. There is some evidence that women pay for entitlements to extended leave by receiving lower relative wages. The econometric estimates are sensitive to the inclusion of controls for time-varying country effects and for sex-specific within-country time trends.

Preliminary Injunctive Relief: Theory and Evidence from Patent Litigation

Jean O. Lanjouw and Josh Lerner

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Productivity

This paper examines the hypothesis that established plaintiffs seek preliminary injunctions to prey on financially weaker firms. We present a model in which differences in litigation costs drive the use of preliminary injunctions in civil litigation. We test the hypothesis using a sample of 252 patent suits, which allows us to characterize the litigating parties while controlling for the nature of the dispute. Our evidence is consistent with the predation hypothesis. We then explore various implications of the model and the impact of policy reforms.

Perceptions of Economic Insecurity: Evidence from the Survey of Economic Expectations

Jeff Dominitz and Charles F. Manski

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Labor Studies

We recently initiated the Survey of Economic Expectations (SEE) in order to learn how Americans perceive their near-term economic futures. Using SEE data on over 2000 labor force participants interviewed in 1994 and 1995, we measure economic insecurity through responses to questions about the probability of three events occurring in the year ahead: absence of health insurance; victimization by burglary; and job loss. With item response rates exceeding 98 percent, respondents clearly are willing to answer the expectations questions, and they appear to do so in a meaningful way.

Using the responses to classify individuals as *relatively secure*, *relatively insecure*, and *highly insecure*, we find that respondents with a high risk of one adverse outcome tend also to perceive high risks of the other outcomes. Economic insecurity tends to decline with age and with schooling. Black respondents perceive much greater insecurity than do whites, especially males. Within 1994–95, we find some time-series variation in insecurity but no clear trends. We find that expectations and realizations of health insurance coverage and of jobs tend to match up quite closely, but respondents substantially overpredict the risk of burglary.

Dynamic Complementarities: A Quantitative Analysis

Russell W. Cooper and Alok Johri

NBER Working Paper No. 5691
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JEL Nos. E32, E23, E37
Economic Fluctuations and Growth

This paper considers the importance of dynamic complementarities as an endogenous source of propagation in a dynamic stochastic economy. Dynamic complementarities link the stocks of human and organizational capital, both of which are influenced by past levels of economic activity, to current levels of productivity. We supplement an otherwise standard dynamic business cycle model with both contemporaneous and dynamic complementarities. We calibrate the model using estimates of these effects. Our quantitative analysis identifies empirically relevant dynamic complementarities as a source of propagation for both technology and taste shocks.

Federal Reserve Private Information and the Behavior of Interest Rates

Christina D. Romer and David H. Romer

NBER Working Paper No. 5692
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JEL Nos. E52, E43, D82
Economic Fluctuations and Growth,
Monetary Economics

Many authors argue that asymmetric information between the Federal Reserve and the public is important for the conduct and the effects of monetary policy. This paper tests for the existence of such information by examining Federal Reserve and commercial inflation forecasts. We demonstrate that the Federal Reserve has considerable information about inflation beyond what is known to commercial forecasters. We also show that monetary policy actions provide signals of the Federal Reserve's private information, and that commercial forecasters modify their forecasts in response to those signals. These findings may explain why long-term interest rates typically rise in response to shifts to tighter monetary policy.

Trade Liberalization and Income Distribution

Donald R. Davis

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JEL Nos. F11, F13, D15
International Trade and Investment

Empirical work relating trade liberalization to income distribution has identified an important anomaly: The Stolper–Samuelson theorem predicts that trade liberalization will shift income toward a country's abundant factor. For developing countries, this suggests that liberalization principally will benefit the abundant unskilled labor. Yet extensive empirical studies have identified many cases with a contrary result.

This paper develops a simple theoretical explanation for this anomaly. It shows that countries that have global abundant labor may see wages decline with liberalization if they have local abundant capital. The current absence of empirical work that would allow us to identify the relevant local abundance implies that virtually all assertions regarding the anticipated distributional consequences of trade liberalization are without foundation. Likewise there may be important implications for industrialized countries that border developing countries that are undertaking trade liberalization, particularly in regard to the incentives for migration.

International Conflict, Defense Spending, and the Size of Countries

Alberto Alesina and Enrico Spolaore

NBER Working Paper No. 5694

August 1996

Monetary Economics

This paper provides a formal model of endogenous country formation and the choice of defense spending in a world with international conflict. The model is consistent with three observations: 1) secessions, and more generally breakup of countries, should follow a reduction in the likelihood of international conflict; 2) the number of regional conflicts among smaller countries may increase as a result of the breakup of larger countries; and 3) the size of the *peace dividend*—that is, the reduction in the defense spending in a more peaceful world—is limited by the process of country breakup.

Quota Licenses for Imported Capital Equipment: Could Bureaucrats Ever Do Better Than the Market?

Barbara J. Spencer

NBER Working Paper No. 5695

August 1996

JEL No. F13

International Trade and Investment

Despite valid criticisms, many developing countries have issued nontransferable import licenses to a limited number of final-goods producers in order to restrict the imports of an input, such as capital equipment. This paper demonstrates that for a given import quota, such licensing restrictions actually can increase domestic production of both the input and the final product, but at the cost of reduced quota rents. Under pure competition, domestic welfare falls relative to the use of marketable quota licenses, but if foreigners otherwise would get the quota rents, or if external economies cause decreasing costs, then bureaucratic allocation can dominate.

A Unified Treatment of Horizontal Direct Investment, Vertical Direct Investment, and the Pattern of Trade in Goods and Services

James R. Markusen, Anthony J. Venables, Denise Eby Konan, and Kevin H. Zhang

NBER Working Paper No. 5696

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JEL Nos. F12, F23

International Trade and Investment

This paper contributes to research that endogenizes multinational firms into general-equilibrium trade models. We attempt to integrate separate contributions on horizontal multinationals, which produce the same final product in multiple locations, with work on vertical multinationals,

which geographically fragment production by stages. Previously derived results now emerge as special cases of a more general model. Vertical multinationals dominate when countries are very different in relative factor endowments. Horizontal multinationals dominate when the countries are similar in size and in relative endowments, and trade costs are moderate to high. In some cases, foreign investment or trade liberalization leads to a reversal in the direction of trade. Investment liberalization also can lead to an increase in the volume of trade, and produces a strong tendency toward factor-price equalization. Thus direct investment can be a complement to trade in both a volume-of-trade sense and in a welfare sense.

Why Are There Rich and Poor Countries? Symmetry-Breaking in the World Economy

Kiminori Matsuyama

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JEL Nos. F12, O12

International Trade and Investment

To explain cross-country differences in economic performance, the economics of coordination failures typically portrays each country in a closed-economy model with multiple equilibriums and then argues that the poor countries' equilibriums are inferior to those of the rich countries. This approach cannot tell us anything about the degree of inequality in the world economy. A more satisfactory approach would be to build a world-economy model and show why it has to be separated into the rich and the poor regions; that is, to demonstrate the coexistence of the rich and poor as an inevitable aspect of the world trading system. In the present model, the symmetry-breaking of the world economy into the rich and the poor

occurs because international trade causes agglomeration of different economic activities in different regions of the world. International trade thus creates a kind of "pecking order" among nations, and as in a game of "musical chairs," some countries must be excluded from being rich.

Determinants of Economic Growth: A Cross-Country Empirical Study

Robert J. Barro

NBER Working Paper No. 5698

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JEL No. O4

Economic Fluctuations and Growth

Empirical findings for a panel of roughly 100 countries from 1960 to 1990 strongly support the general notion of conditional convergence. For a given starting level of real per capita GDP, the growth rate is enhanced by higher initial schooling and life expectancy, lower fertility, lower government consumption, better maintenance of the rule of law, lower inflation, and improvements in the terms of trade. For given values of these and other variables, growth is related negatively to the initial level of real per capita GDP. Political freedom has only a weak effect on growth, but there is some indication that the relationship is nonlinear. At low levels of political rights, an expansion of these rights stimulates economic growth. However, once a moderate amount of democracy has been attained, a further expansion reduces growth. In contrast to the minor effect of democracy on growth, there is a strong positive influence of the standard of living on a country's propensity to experience democracy.

From Obscurity to Notoriety: A Biography of the Exchange Stabilization Fund

Anna J. Schwartz

NBER Working Paper No. 5699

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JEL No. E52

Monetary Economics

The U.S. Treasury's \$20 billion loan to Mexico in January 1995 from the Exchange Stabilization Fund (ESF) brought to public notice the fund that had functioned in obscurity since its authorization by the Gold Reserve Act of January 31, 1934. The design of the ESF, as set forth in the statute, contributed to its obscurity. Its stated mission was to stabilize the exchange value of the dollar, but it also has assumed a role that had no mandate, that of lender to favored countries. ESF's intervention activities and the Federal Reserve's warehousing of ESF foreign currency assets are questionable. A statistical profile of the ESF accounts for the growth of its working balance from \$200 million in 1934 to \$42.6 billion in assets in 1995.

The Endogeneity of the Optimum Currency Area Criteria

Jeffrey A. Frankel and Andrew K. Rose

NBER Working Paper No. 5700

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JEL Nos. F15, F41

International Trade and Investment, International Finance and Macroeconomics

A country's suitability for entry into a currency union depends on a number of economic conditions. These include, inter alia, the intensity of trade with other potential members of the currency union and the extent to which domestic business cycles are correlated with business cycles of the other countries.

But international trade patterns and international business cycle correlations are endogenous. This paper develops and investigates the relationship between the two. Using 30 years of data for 20 industrialized countries, we uncover a strong and striking empirical finding: countries with closer trade links tend to have business cycles that are more tightly correlated. It follows that countries are more likely to satisfy the criteria for entry into a currency union after they take steps toward economic integration than before.

Do Financial Incentives Encourage Welfare Recipients to Work? Evidence from a Randomized Evaluation of the Self-Sufficiency Project

David Card and Philip K. Robins

NBER Working Paper No. 5701

August 1996

JEL No. I3

Labor Studies

This paper reports on a randomized evaluation of an earnings subsidy offered to long-term welfare recipients in Canada. The program—known as the Self-Sufficiency Project (SSP)—provides a supplement equal to one-half the difference between a target earnings level and a participant's actual earnings. The SSP supplement is similar to a negative income tax with two important differences: 1) eligibility is limited to long-term welfare recipients who find a full-time job; and 2) the payment depends on individual earnings rather than on family income. Our evaluation is based on a classical randomized design: one-half of a group of single parents who had been on welfare for over a year were eligible to receive the SSP supplement, while the other half were assigned to a control group. Results for an early cohort of SSP partici-

pants and controls suggest that the financial incentives of the SSP increase labor market attachment and reduce welfare participation.

Social Policy Dimensions of Economic Integration: Environmental and Labor Standards

Kym Anderson

NBER Working Paper No. 5702

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JEL Nos. F13, F15

International Trade and Investment

Social policies, particularly with regard to the environment and labor, have become a part of trade policy-making, including the General Agreement on Tariffs and Trade. However, they are likely to have a more prominent role in trade policy discussions in the years ahead for the new World Trade Organization (WTO). Many developing countries perceive the entwining of these social issues with trade policy as a threat both to their sovereignty and to their economies, while significant groups in advanced economies consider it unfair, ecologically unsound, and even immoral to trade with countries adopting much lower standards than theirs.

This paper examines why these issues are becoming more prominent, whether the WTO is an appropriate forum for discussing them, and how they affect developing and other economies. I conclude that the *direct* effect on developing economies is likely to be small, and for some may even be positive through improved terms of trade and/or compensatory transfer payments; but there is an important *indirect* negative effect on them and other economies, namely, the potential erosion of the rules-based multilateral trading system that would result from an overuse of trade measures to pursue environmental or labor market objectives.

Chaos, Sunspots, and Automatic Stabilizers

Lawrence J. Christiano and Sharon G. Harrison

NBER Working Paper No. 5703

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JEL Nos. E13, E32, E61

Economic Fluctuations and Growth

We study a one-sector growth model that is standard except for the presence of an externality in the production function. The set of competitive equilibria is large. It includes constant, sunspot, cyclical and chaotic equilibria, and equilibria with deterministic or stochastic regime switching. The efficient allocation is characterized by constant employment and a constant growth rate. We identify as the unique equilibrium outcome an income tax-subsidy schedule that supports the efficient allocation. That schedule has two properties: 1) it specifies the tax rate to be an increasing function of aggregate employment, and 2) earnings are subsidized when aggregate employment is at its efficient level. The first feature eliminates inefficient, fluctuating equilibria, while the second induces agents to internalize the externality.

Inequality, Predation, and Welfare

Herschel I. Grossman and Minseong Kim

NBER Working Paper No. 5704

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JEL Nos. D31, D50, D63, D61

Economic Fluctuations and Growth

This paper studies the relationship between inequality and welfare in a general-equilibrium model in which people can choose to be either producers or predators. We assume that some people (the privileged) are well endowed with human capital, and other people (the unprivileged) are poorly endowed with human capital.

We analyze how the choice the privileged make between deterring and tolerating predation by the unprivileged depends on the interpersonal distribution of human capital. We find that if there are many unprivileged people, but that a privileged person does not have too much human capital relative to an unprivileged person, then the privileged will allocate enough time and effort to guarding against predation to deter the unprivileged from being predators. Otherwise, the privileged will tolerate predation by the unprivileged. Interestingly, a distribution of human capital that is more egalitarian (in that there are fewer unprivileged people) can result in the privileged choosing to tolerate rather than to deter predation by the unprivileged.

Next, we partition the feasible distributions of human capital into two sets of distributions, one that is Pareto efficient and one that is Pareto inefficient. Interestingly, we find that if the average endowment of human capital is large, then the fully egalitarian distribution is not Pareto efficient. Instead, Pareto efficiency implies an unequalitarian distribution of human capital in which each unprivileged person has only the endowment of human capital with which he was born. In addition, this unequalitarian distribution satisfies the Rawlsian criterion of maximizing the consumption of the unprivileged. With this unequalitarian distribution, the privileged choose to tolerate predation by the unprivileged, and predation results in maximum consumption for everyone.

Incentives and Careers in Organizations

Robert Gibbons

NBER Working Paper No. 5705

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JEL Nos. J41, J33, D23

Labor Studies

This paper surveys two related pieces of the labor economics literature: incentive pay and careers in organizations. In the discussion of incentives, I first summarize theory and evidence related to the classic agency model, which emphasizes the trade-off between insurance and incentives. I then offer econometric and case-study evidence suggesting that this classic model ignores several crucial issues, and sketch new models that begin to analyze these issues. In the discussion of careers in organizations, I begin by summarizing evidence on wages and positions using panel data within firms. This evidence is sparse and far-flung (drawn from industrial relations, organizational behavior, and sociology, as well as from labor economics). I identify ten basic questions that merit more systematic investigation. Turning to theory, I describe building-block models that address one or a few pieces of evidence, but focus on more recent models that address broad patterns of evidence.

Does Economic Geography Matter for International Specialization?

Donald R. Davis and

David E. Weinstein

NBER Working Paper No. 5706

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International Trade and Investment

There are two principal theories of why countries trade: comparative advantage and increasing returns to scale. Yet there is no empirical work that assesses the relative importance of these two theories in accounting for production structure and trade. We use a framework that nests an

increasing returns model of economic geography featuring "home market" effects with that of Heckscher–Ohlin–Vanek. We employ these trade models to account for the structure of OECD manufacturing production. The data militate against the economic geography framework. Moreover, even in the specification most generous to economic geography, endowments account for 90 percent of the explainable variance, and economic geography only 10 percent.

Construction of the Earnings and Benefits File for Use with the Health and Retirement Survey

Olivia S. Mitchell,

Jan Olson, and

Thomas L. Steinmeier

NBER Working Paper No. 5707

August 1996

Aging, Labor Studies

Analysts using the Health and Retirement Survey (HRS) often require information on earnings, labor market attachment, and Social Security benefits in order to better understand the factors affecting retirement and well-being at older ages. To this end the Earnings and Benefits File (EBF) constructed and documented several derived variables described here. The EBF provides a set of summary earnings, employment, and Social Security wealth measures for a subset of HRS respondents in Wave 1 of the survey, for whom administrative records are available.

The EBF, a restricted data file, is available from the University of Michigan's Institute for Social Research for matching only with versions of the HRS containing geographic detail no finer than the Census Division level. Interested users should contact hrsrequest@umich.edu by email for further information on access to the data.

School Resources and Student Outcomes: An Overview of the Literature and New Evidence from North and South Carolina

David Card and Alan B. Krueger

NBER Working Paper No. 5708

August 1996

JEL No. J24

Labor Studies

This paper reviews and interprets the literature on the effect of school resources on students' eventual earnings and educational attainment. In addition, we present new evidence on the impact of the great disparity that existed in the first half of the 20th century in school resources between black and white students in North and South Carolina, and the subsequent narrowing of these resource disparities. Looking at birth cohorts over time, we find that gaps in earnings and educational attainment for blacks and whites in the Carolinas tend to mirror the gaps in school resources.

Real Exchange Rate Levels, Productivity, and Demand Shocks: Evidence from a Panel of 14 Countries

Menzie Chinn and

Louis Johnston

NBER Working Paper No. 5709

August 1996

JEL Nos. F31, F41

International Finance and

Macroeconomics

This paper investigates the determinants of the real exchange rate using a panel of disaggregated data for the OECD countries. It also marries two literatures: one that uses panel data to measure relationships between changes in exchange rates and changes in the determinants, and the other that uses cointegration techniques to measure the long-run relationship between the level of the exchange rate and the level of the determining factors. The previous

panel studies cannot account for deviations from long-run trend levels, while the extant literature, using time-series cointegration techniques, can only intermittently detect and measure posited relationships. Estimating the relationships in levels is an interesting enterprise because it allows one, in principle, to calculate trend real exchange rates.

After surveying the previous literature, we use a dynamic model of the real exchange rate to motivate the empirical exercise. In examining this problem, we exploit recent developments in the econometric analysis of nonstationary variables in panel data. Our results indicate that under certain assumptions, it is easier to detect cointegration in panel data than in the available time series; moreover, the estimates of reversion to trend also are estimated with greater precision. The most empirically successful models⁷ include productivity measures, government spending ratios, and either the terms of trade or the real price of oil. Using this latter model, we find that the implied equilibrium exchange rates indicate less overvaluation of the dollar than what is implied by a naive version of purchasing power parity.

Why Clashes Between Internal and External Stability Goals End in Currency Crises, 1797–1994

Michael D. Bordo and Anna J. Schwartz

NBER Working Paper No. 5710

August 1996

JEL No. E65

International Finance and Macroeconomics, Monetary Economics

We argue that recent currency crises reflect clashes between fundamentals and pegged exchange rates, just as crises did in the past. We reject the view that crises reflect self-fulfilling prophecies that are not

closely related to measured fundamentals. Doubts about the timing of a market attack on a currency are less important than the fact that it is bound to happen if a government's policies are not consistent with pegged exchange rates. We base our conclusions on a review of currency crises in the historical record under metallic monetary regimes and of crises after World War II both under Bretton Woods and since, in European and Latin American pegged exchange rate regimes.

Risk-Shifting by Federally Insured Commercial Banks

Armen Hovakimian and Edward J. Kane

NBER Working Paper No. 5711

August 1996

JEL Nos. G2, K2, L5

Corporate Finance

Mispriced and misadministered deposit insurance imparts risk-shifting incentives to U.S. banks. Regulators are expected to monitor and discipline increases in bank risk exposure that would transfer wealth from the FDIC to bank stockholders. This paper assesses the success regulators had in controlling risk-shifting by U.S. banks during 1985–94. In contrast to single-equation estimates developed from the option model by others, our simultaneous-equation evidence indicates that regulators failed to prevent large U.S. banks from shifting risk to the FDIC. Moreover, at the margin, banks that are undercapitalized shifted risk more effectively than other sample banks.

Flows of Knowledge from Universities and Federal Labs: Modeling the Flow of Patent Citations over Time and across Institutional and Geographic Boundaries

Adam B. Jaffe and Manuel Trajtenberg

NBER Working Paper No. 5712

August 1996

JEL No. O3

Productivity

The extent to which new technological knowledge flows across institutional and national boundaries is a question of great importance for public policy and the modeling of economic growth. This paper develops a model of the process generating subsequent citations to patents as a lens for viewing knowledge diffusion. We find that the probability of patent citation over time after a patent is granted fits well to a double-exponential function that can be interpreted as the mixture of diffusion and obsolescence functions. The results indicate that diffusion is localized geographically. Controlling for other factors, within-country citations are more numerous and come more quickly than those that cross country boundaries.

The Demand for Cocaine by Young Adults: A Rational Addiction Approach

Michael Grossman, Frank J. Chaloupka, and Charles C. Brown

NBER Working Paper No. 5713

August 1996

JEL No. I10

Health Economics

This paper applies to the demand for cocaine by young adults in the Monitoring the Future Panel rational addiction model, which emphasizes the interdependency of past, current, and future consumption of an addictive good. We add to this survey the

price of cocaine from the System to Retrieve Information from Drug Evidence maintained by the Drug Enforcement Administration of the U.S. Department of Justice. Our results suggest that annual participation and frequency of use given participation are related negatively to the price of cocaine. In addition, current participation is related positively to past and future participation, and current frequency of use given participation is related positively to past and future frequency of use. The long-run price elasticity of total consumption (that is, participation multiplied by frequency given participation) of -1.18 is substantial. A permanent 10 percent reduction in price caused, for example, by the legalization of cocaine would cause the number of cocaine users to grow by slightly more than 8 percent and would increase the frequency of use among users by a little more than 3 percent. Surely, both proponents and opponents of drug legalization should take account of this increase in consumption in debating their respective positions.

Country Fund Discounts, Asymmetric Information, and the Mexican Crisis of 1994: Did Local Residents Turn Pessimistic Before International Investors?

Jeffrey A. Frankel and Sergio L. Schmukler

NBER Working Paper No. 5714

August 1996

JEL Nos. F30, F34, G15

Asset Pricing, International Finance and Macroeconomics

It has been suggested that Mexican investors were the "front-runners" in the peso crisis of December 1994, turning pessimistic before international investors. Different expectations about their own economy, perhaps attributable to asymmetric information, prompted

Mexican investors to be the first ones to leave the country. This paper uses data from three Mexican country funds to investigate the hypothesis of "divergent expectations." We find that right before the devaluation, Mexican fund Net Asset Values (NAVs, mainly driven by Mexican investors) dropped faster than Mexican country fund prices (mainly driven by foreign investors). Moreover, we find that Mexican NAVs tend to Granger-cause the country fund prices. This suggests that causality, in some sense, flows from the Mexico City investor community to the Wall Street investor community. More generally, we propose an asymmetric information approach that differs from the existing explanations of country fund discounts.

Is "Learning-by-Exporting" Important? Microdynamic Evidence from Colombia, Mexico, and Morocco

Sofronis Clerides, Saul Lach, and James Tybout

NBER Working Paper No. 5715

August 1996

International Trade and Investment

Is there any empirical evidence that firms become more efficient after becoming exporters? Do firms that become exporters generate positive spillovers for domestically oriented producers?

In this paper, we analyze the causal links between exporting and productivity using firm-level panel data from three semi-industrialized countries. Representing export market participation and production costs as jointly dependent autoregressive processes, we look for evidence that firms' stochastic cost processes shift when they break into foreign markets. We find that relatively efficient firms become exporters, but firms' unit costs are

not affected by previous export market participation. So the well-known efficiency gap between exporters and nonexporters is caused by self-selection of the more efficient firms into the export market, rather than by learning by exporting. Further, we find some evidence that exporters reduce the costs of breaking into foreign markets for domestically oriented producers, but they do not appear to help these producers become more efficient.

The Response of Wages and Actual Hours Worked to the Reductions of Standard Hours

Jennifer Hunt

NBER Working Paper No. 5716

August 1996

JEL Nos. J31, J51

Labor Studies

A transformation of what had become a universal 40-hour standard work week in Germany began in 1985 with reductions negotiated in the metalworking and printing sectors. These reductions have continued through 1995, and were followed by reductions in other sectors. The union campaign aimed to increase employment through "work-sharing," and is being emulated in the United States with the launch of a reduced-hours campaign by the AFL-CIO. Using data from the German Socio-Economic Panel, I find that increased overtime or reduced short time was little used to offset the reduction in standard hours: a one-hour reduction in standard hours appears to have translated into a reduction in actual hours worked of between 0.85 hour and one hour for workers in manufacturing. One might expect this to have resulted in a loss of earnings for workers in affected industries. However, I substantiate the union claim of "full wage compensation": reductions in standard hours were

accompanied by a relative rise in the hourly straight-time wage of 2–3 percent for each hour fall in standard hours, enough to keep monthly earnings the same as in unaffected industries.

The Strategic Response by Pharmaceutical Firms to the Medicaid Most-Favored-Customer Rules

Fiona Scott Morton

NBER Working Paper No. 5717

August 1996

JEL Nos. L13, L41, L65

Industrial Organization

In 1990 the federal government included a Most Favored Customer (MFC) clause in the contract (OBRA 90) that would govern the prices paid to firms for pharmaceutical products supplied to Medicaid recipients. The firms had to give Medicaid their “best” (lowest) price in some cases, and a percentage below average price in others. Many theoretical models have shown that an MFC rule commits a firm to compete less aggressively in prices. We might expect prices to rise following the implementation of the MFC rule, yet the work done to date on OBRA 90 has found this result somewhat difficult to show empirically. I also conclude that the effects of the law are small and relatively weak; however, the results are strongest where the product’s characteristics match the incentives in the law. I find that after the MFC rule was implemented, the average price of branded products facing generic competition rose: the median presentation’s price rose about 4 percent. Brands protected by patents did not increase price significantly. Generics in concentrated markets should display a strategic response to the brand’s adoption of the MFC. I find support for the strategic effect: generic firms raise their prices more as their markets become more concentrated. I find little

change in hospital prices. The results suggest that the MFC rule resulted in higher prices to some non-Medicaid consumers of pharmaceuticals.

Wage Inequality and Segregation by Skill

Michael Kremer and Eric Maskin

NBER Working Paper No. 5718

August 1996

JEL Nos. D30, J31

Economic Fluctuations and Growth, Labor Studies

Evidence from the United States, Britain, and France suggests that recent growth in wage inequality has been accompanied by greater segregation of high- and low-skill workers into separate firms. A model in which workers of different skill levels are imperfect substitutes can account simultaneously for these increases in segregation and inequality, either through technological change or, more parsimoniously, through observed changes in the skill distribution.

Price Level Targeting Versus Inflation Targeting: A Free Lunch?

Lars E. O. Svensson

NBER Working Paper No. 5719

August 1996

JEL Nos. E42, E52, E58

International Finance and Macroeconomics, Monetary Economics

I compare price level targeting (without base drift) and inflation targeting (with base drift) under commitment and discretion, with persistence in unemployment. Price level targeting often is said to imply more short-run inflation variability, and thereby more employment variability, than inflation targeting. Counter to this conventional wisdom, under discretion a price level target results in *lower* inflation variability than an inflation target (if unemployment is at least moderately

persistent). A price level target also eliminates the inflation bias under discretion and, as is well known, reduces long-term price variability. Society may be better off assigning a price level target to the central bank even if its preferences correspond to inflation targeting. A price level target thus appears to have more advantages than commonly acknowledged.

The Yen and Its East Asian Neighbors, 1980–95: Cooperation or Competition?

Shinji Takagi

NBER Working Paper No. 5720

August 1996

JEL Nos. F31, F33

By looking at how an East Asian currency moves when the yen fluctuates sharply against the U.S. dollar, we sometimes find that the reaction has been much more significant than would be suggested by the econometric estimates of the weight of the yen in nominal exchange rate determination. Moreover, the Korean won and the Malaysian ringgit have tended to move more closely with a depreciating yen, suggesting the countries’ emphasis on export promotion. The Singapore dollar, on the other hand, has tended to move more closely with an appreciating yen, underscoring the importance attached to price stability. The paper concludes that, given the trend appreciation of the yen during the recent past, emphasis on price stability has contributed more to monetary cooperation in Asia than has emphasis on export promotion.

Technology, Employment, and the Business Cycle: Do Technology Shocks Explain Aggregate Fluctuations?

Jordi Galí

NBER Working Paper No. 5721

August 1996

JEL Nos. E32, E24

Economic Fluctuations and Growth

Using data for the G7 countries, I estimate *conditional* correlations of employment and productivity, based on a decomposition of the two series into technology and nontechnology components. The picture that emerges is hard to reconcile with the predictions of the standard Real Business Cycle model. For a majority of countries the following results stand out: 1) *technology shocks* appear to induce a *negative* comovement between productivity and employment, counterbalanced by a *positive* comovement generated by *demand shocks*; 2) the impulse responses show a persistent *decline* of employment in response to a *positive* technology shock; and 3) measured productivity *increases* temporarily in response to a *positive* demand shock. More generally, the pattern of economic fluctuations attributed to technology shocks seems to be largely unrelated to major post-war cyclical episodes. A simple model with monopolistic competition, sticky prices, and variable effort is able to account for the empirical findings.

Technology, Factor Supplies, and International Specialization: Estimating the Neoclassical Model

James Harrigan

NBER Working Paper No. 5722

August 1996

JEL Nos. F1, F10, F11

International Trade and Investment

The standard neoclassical model of trade theory predicts that interna-

tional specialization will be determined jointly by cross-country differences in relative factor endowments and relative technology levels. This paper uses duality theory combined with a flexible functional form to specify an empirical model of specialization consistent with the neoclassical explanation. According to the model, a sector's share in GDP depends on both relative factor supplies and relative technology differences; the estimated parameters of the model have a close and clear connection to theoretical parameters. I estimate the model for manufacturing sectors using a 20-year, 10-country panel of data on the OECD countries. I measure Hicks-neutral technology differences using an application of the theory of total factor productivity comparisons, and I measure factor supplies directly. The estimated model performs well in explaining variation in production across countries and over time, and the estimated parameters are generally in line with theory and previous empirical work on the factor proportions model. I find that relative technology levels are an important determinant of specialization.

Hong Kong's Currency Board and Changing Monetary Regimes

Yum K. Kwan and Francis T. Lui

NBER Working Paper No. 5723

August 1996

JEL Nos. E5, E6, F4

This paper discusses the historical background and institutional details of Hong Kong's currency board. We argue that its experience provides a good opportunity to test the macroeconomic implications of the currency board regime. Using the method of Blanchard and Quah (1989), we show that the parameters of the structural equations and the characteristics of supply and demand

shocks have changed significantly since adopting the regime. Variance decomposition and impulse response analyses indicate Hong Kong's currency board is less susceptible to supply shocks, but demand shocks can cause greater short-term volatility under the system. The decent performance of Hong Kong's currency board is mainly attributable to the stable fiscal policy of its government. Counterfactual exercises also show that three-fourths of the reduction in observed output volatility and two-thirds of the reduction in observed inflation volatility are explained by the adoption of the currency board, while the remainder is explained by changes in the external environment. The improvement in stability does not rule out the possibility of monetary collapse, however.

Has Work-Sharing Worked in Germany?

Jennifer Hunt

NBER Working Paper No. 5724

August 1996

JEL No. J23

Labor Studies

Starting in 1985, (West) German unions began to reduce standard hours on an industry-by-industry basis in an attempt to lower unemployment. Whether "work-sharing" works—that is, whether employment rises when hours per worker are reduced—is theoretically ambiguous. I test this using both individual data from the German Socio-Economic Panel and industry data to exploit the variation in cross-section and time-series hours. For 1984–9 I find that, in response to a one-hour fall in standard hours, employment rose by 0.3–0.7 percent, but that total hours worked fell 2–3 percent, implying possible output losses. As a group, workers were better off however, as the wage bill rose. The employment growth implied by the

mean standard hours decline, at most 1.1 percent, was not enough to bring German employment growth close to the U.S. rate. Results for 1990-4 were more pessimistic.

**Capital Account
Liberalization as a Signal**
**Leonardo Bartolini and
Allan Drazen**

NBER Working Paper No. 5725
August 1996
JEL Nos. F21, C73
International Finance and
Macroeconomics

We present a model in which a government's current policy on capital controls signals future policies. Controls on capital outflows evolve in response to news on technology, conditional on government attitudes toward taxation of capital. When there is uncertainty over government types, a policy of liberal capital outflows sends a favorable signal that may trigger a capital inflow. This prediction is consistent with the experience of several countries that have liberalized their capital account.

**Market Segmentation and
the Sources of Rents from
Innovation: Personal
Computers in
the Late 1980s**

**Timothy F. Bresnahan,
Scott Stern, and
Manuel Trajtenberg**

NBER Working Paper No. 5726
August 1996
JEL Nos. L1, O31
Industrial Organization, Productivity

This paper evaluates the sources of transitory market power in the market for personal computers (PCs) during the late 1980s. Our analysis is motivated by the coexistence of low entry barriers into the PC industry and high rates of innovative investment by a small number of PC manufacturers. We attempt to understand these phenomena by measuring the

role played by different *principles of product differentiation* (PDs) in segmenting this dynamic market. Our first PD measures the substitutability between Frontier (386-based) and non-Frontier products, while the second PD measures the advantage afforded by a brand-name reputation (for example, by IBM). Building on advances in the measurement of product differentiation, we measure the separate roles that these PDs played in contributing to transitory market power. In so doing, this paper attempts to account precisely for the market origins of innovative rents in the PC industry.

Our principal finding is that, during the late 1980s, the PC market was highly segmented along both the Branded (B versus NB) and Frontier (F versus NF) dimensions. The effects of competitive events in any one cluster were confined mostly to that particular cluster, with little repercussion on other clusters. For example, less than 5 percent of the market share achieved by a hypothetical clone entrant would be market-stealing from other clusters. In addition, the product differentiation advantages of B and F were qualitatively different. The principal benefit associated with F was limited to the isolation it provided from the NF competitors; brandedness shifted out the product demand curve and segmented B products from NB competition. These results help to explain, in a precise way, how transitory market power (arising from market segmentation) shaped the underlying incentives for innovation in the PC industry during the mid- to late 1980s.

**When Liberal Policies
Reflect External Shocks,
What Do We Learn?**

**Leonardo Bartolini and
Allan Drazen**

NBER Working Paper No. 5727
August 1996
JEL Nos. F21, C73
International Finance and
Macroeconomics

We present a model in which policies of free capital mobility can signal governments' future policies, but the informativeness of the signal depends on the path of world interest rates. Capital flows to "emerging markets" reflect investors' perception of these markets' political risk. With low world interest rates, emerging markets experience a capital inflow and engage in a widespread policy of free capital mobility; with higher rates, only sufficiently committed countries allow free capital mobility, whereas others impose controls to trap capital onshore, thus signaling future policies affecting capital mobility. These predictions are consistent with the recent experience of capital flows and policies affecting capital mobility in developing countries.

**Price Versus Quantity:
Market Clearing
Mechanisms When Sellers
Differ in Quality**

**Andrew Metrick and
Richard J. Zeckhauser**

NBER Working Paper No. 5728
August 1996
JEL Nos. L11, L62, G20
Industrial Organization

High-quality producers in a vertically differentiated market can reap superior profits by charging higher prices, selling greater quantities, or both. If qualities are known by consumers and production costs are constant, then having a higher quality secures the producer both a higher price and higher quantity; if

marginal costs are rising, having a higher quality assures only higher price. If only some consumers can discern quality but others cannot, then high- and low-quality producers may set a common price, but the high-quality producer will sell more. In this context, quality begets quantity. Empirical analyses suggest that in both the mutual fund and the automobile industries, high-quality producers sell more units than their low-quality competitors, but at no higher price (or markup) per unit.

Unraveling in Assignment Markets **Li, Hao and Sherwin Rosen**

NBER Working Paper No. 5729
August 1996
Labor Studies

We present a two-period model of the assignment market with uncertainty in the first period regarding productive characteristics of participants. We use this model to understand incentives toward early contracts or unraveling in labor markets for entry-level professionals. We study two contractual situations, one in which firms are bound by ex post unsuccessful early contracts, and the other in which they can buy out of unsuccessful early contracts. The economic benefit of unraveling is to provide insurance in the absence of complete markets, but it can come at the cost of inefficient assignments. Without reentry, unraveling need not occur. It is more likely, the smaller the applicant pool or the proportion of more promising applicants in the pool, and the greater the degree of heterogeneity in the pool. A ban on early contracts always hurts firms and benefits less promising applicants, but the welfare effects on more promising applicants depend on how the gains from early contracts are shared. With buyouts, inefficiencies in assignments are eliminated, and unraveling always

occurs between firms and the more promising applicants. The efficiency gains of buyouts can be distributed unevenly and sometimes firms benefit from a ban on buyouts.

Fiscal Adjustments in OECD Countries: Composition and Macroeconomic Effects **Alberto Alesina and Roberto Perotti**

NBER Working Paper No. 5730
August 1996
JEL Nos. H1, H5, E62
Monetary Economics

This paper studies how the composition of fiscal adjustments influences the likelihood of their "success," defined as long-lasting deficit reduction, and their macroeconomic consequences. We find that fiscal adjustments that rely primarily on spending cuts in transfers and in the government wage will have a better chance of being successful, and are expansionary. On the contrary, fiscal adjustments that rely primarily on tax increases and cuts in public investment tend not to last, and are contractionary. We discuss alternative explanations for these findings by studying both a full sample of OECD countries and by focusing on three individual case studies: Denmark, Ireland, and Italy.

Private Consumption, Nontraded Goods, and Real Exchange Rate: A Cointegration-Euler Equation Approach **Kenneth S. Lin**

NBER Working Paper No. 5731
August 1996

This paper presents an empirical study of real exchange rate movements from a consumer's perspective. Trade between two countries creates a link between the real exchange rate and the terms of trade. It is the private consumption

of nontraded goods that induces an equilibrium relationship between the real exchange rate and the private consumption of both traded and nontraded goods. I use Ogaki and Park's (1989) cointegration-Euler equation approach to explore the long-run implications of the equilibrium relationship. Given the assumption of stationary preference shocks, the testable restriction is that the real exchange rate and private consumption of traded and nontraded goods in the home and foreign countries are cointegrated. The empirical evidence suggests that private consumption in the home and foreign countries accounts for a significant fraction of the long-run movements of the real exchange rate in South Korea and Taiwan. Accounting for real government consumption does not overturn the result.

Trade and Growth in East Asian Countries: Cause and Effect?

**Jeffrey A. Frankel,
David H. Romer, and
Teresa Cyrus**

NBER Working Paper No. 5732
August 1996
JEL Nos. O1, O4, O53
International Trade and Investment,
International Finance and
Macroeconomics, Economic
Fluctuations and Growth

Estimates of growth equations have found that openness plays a role, particularly in explaining rapid growth among East Asian countries. But there have been major concerns about simultaneous causality between growth and trade. This study deals with the endogeneity of trade by using as instrumental variables the exogenous determinants from the gravity model of bilateral trade, such as proximity to trading partners. We find that the effect of openness on growth is even stronger when we correct for the endogeneity of open-

ness than it is in standard ordinary least squares estimates. We conclude with estimates of how much has been contributed to East Asian growth both by the exogenous or geographical component of openness and by the residual or policy component.

Women Helping Women? Role-Model and Mentoring Effects on Female Ph.D. Students in Economics

**David Neumark and
Rosella Gardecki**

NBER Working Paper No. 5733
August 1996
JEL Nos. I20, J16, J24, J44
Labor Studies

One potential method for increasing the success of female graduate students in economics may be to encourage mentoring relationships between these students and female faculty members. Increased hiring of female faculty is viewed as one way to promote such mentoring relationships, perhaps because of role-model effects. A more direct method of promoting such relationships may be for female graduate students to have female faculty serve as dissertation chairs. The evidence in this paper addresses the question of whether either of these strategies results in more successful outcomes for female graduate students. The evidence is based on survey information on female graduate students and faculties of Ph.D.-producing economics departments, covering the mid-1970s to the early 1990s.

With respect to characteristics of the institutions at which students are placed when leaving graduate school, the empirical evidence provides no support for the hypothesis that outcomes for female graduate students are improved by adding female faculty members, or by having a female dissertation chair. However, with respect to time-to-

complete-graduate-school, and the completion rate, there is some limited evidence of beneficial effects of female faculty members.

Administrative Costs in Public and Private Retirement Systems

Olivia S. Mitchell

NBER Working Paper No. 5734
August 1996
Aging

This paper collects and analyzes available information on administrative costs associated with public and private retirement systems. We analyze the expenses of the U.S. Social Security system and compare them with data from national systems in other countries. We find that administration costs of publicly run social security systems vary a great deal across countries and institutional settings. A key factor influencing the costs of public old-age programs is the scale of the system: plans with more assets and more participants are less expensive. We also investigate the expenses reported by U.S. pension plans and mutual funds, programs seen by many as alternative mechanisms for managing retirement saving. Based on an analysis of costs associated with retirement savings plans managed by financial institutions, we conclude that privately managed old-age retirement programs would be somewhat more costly to operate than current publicly managed programs, depending on the specific design of the program. Nevertheless, these costs would be accompanied by new services for participants.

The Time-Varying NAIRU and Its Implications for Economic Policy

Robert J. Gordon

NBER Working Paper No. 5735
August 1996
JEL Nos. E30, E31
Economic Fluctuations and Growth

This paper estimates the NAIRU (which stands for Non-Accelerating Inflation Rate of Unemployment) as a parameter that varies over time. The NAIRU is the unemployment rate that is consistent with a constant rate of inflation. Its value is determined in an econometric model in which the inflation rate depends on its own past values ("inertia"), demand shocks proxied by the difference between the actual unemployment rate and the estimated NAIRU, and a set of supply shock variables.

The estimated NAIRU for the U.S. economy differs somewhat for alternative measures of the inflation rate. The NAIRU estimated for the GDP deflator varies over the past 40 years within the narrow range of 5.7 to 6.4 percent; for the most recent quarter (1996:Q1) its estimated value is 5.7 percent. In that quarter, a lower NAIRU of 5.3 percent is obtained for the chain-weighted PCE deflator. I reject the recent research claiming that there is a 3-percentage-point range of uncertainty about the NAIRU as inconsistent with the behavior of the American economy in the late 1980s and early 1990s.

Are 401(k) Plans Replacing Other Employer-Provided Pensions? Evidence from Panel Data

Leslie E. Papke

NBER Working Paper No. 5736
August 1996
JEL No. H3
Aging, Public Economics

This paper examines whether sponsors of traditional defined-ben-

efit (DB) plans are replacing them with 401(k) or other defined-contribution (DC) plans. I compare pension plan offerings by sponsors of a DB plan in 1985 with their offerings in 1992, using Form 5500 filings from those two years. I find that 401(k) and other DC plans are substituting for terminated DB plans, and that offering a DC plan of any type increases the probability of a DB termination. Thus, it appears that, at the sponsor level, many of the new 401(k) plans may not be avenues for net saving but are replacements for the more traditional pension forms.

Using several specifications, I estimate that a sponsor that starts with no 401(k) or other DC plan and adds a 401(k) will reduce the number of DB plans offered by at least 0.3. That is, my estimates imply that one sponsor terminates a DB plan for about every three sponsors that offer one new 401(k) plan. I estimate that the addition of a non-401(k) DC plan reduces DB plan offerings by at least 0.4.

Plan-level point estimates indicate that if a 401(k) plan is added by a sponsor, the DB termination probability increases by about 18 percentage points, to 35 percent. The addition of a non-401(k) DC plan similarly increases the probability that an accompanying DB plan will be terminated.

Crime, Urban Flight, and the Consequences for Cities

Julie Berry Cullen and Steven D. Levitt

NBER Working Paper No. 5737

September 1996

JEL Nos. K42, R23, H71

Public Economics

This paper demonstrates that rising crime rates in cities are correlated with depopulation of the city. Instrumental variables estimates, which use measures of the certainty

and severity of a state's criminal justice system as indicators of city crime rates, imply that crime causes urban flight. Using annual city-level panel data, we estimate that each additional reported crime is associated with a decline of one city resident. There is some evidence that increases in suburban crime tend to keep people in cities, although the magnitude of this effect is small. Analysis of individual-level data from the 1980 Census confirms the city-level results and demonstrates that almost all of the crime-related decline in population is attributable to increased outmigration rather than to a decrease in new arrivals to a city. Those households that leave the city because of crime are much more likely to remain within the SMSA than those leaving the city for other reasons. The migration decisions of high-income households and those with children are much more responsive to changes in crime than the decisions of other households. Crime-related mobility imposes costs on those who choose to remain in the city through declining property values and a shrinking tax base.

Cash Welfare as a Consumption-Smoothing Mechanism for Single Mothers **Jonathan Gruber**

NBER Working Paper No. 5738

September 1996

Public Economics, Labor Studies

While there has been considerable research on the disincentive effects of cash welfare under the Aid to Families with Dependent Children (AFDC) program, there is little evidence on the benefits of the program for single mothers and their children. One potential benefit of this program is that it provides short-run consumption insurance for women at the point that they become single mothers. This is true, however, only

to the extent that the program is not crowding out other sources of support, such as own savings, labor supply, or transfers from others. I assess the importance of this insurance mechanism by measuring the extent to which AFDC smooths the consumption of women who are making the transition to single motherhood. I use longitudinal data on family structure and consumption expenditures on food and housing from the Panel Study of Income Dynamics, matched to information on the welfare benefits available in each state and year from 1968–85. I find that raising potential benefits by one dollar raises the food and housing consumption of all women who become single mothers (and their families) by 30 cents. This estimate implies that for each dollar of AFDC received by this population, the consumption of these categories of goods rises by up to 95 cents. This consumption-smoothing benefit appears to be larger for women who become single mothers through marital dissolution, rather than through out-of-wedlock childbearing; this is attributable to increased housing expenditures of the former group but not of the latter.

Macroeconomic Policy in the Presence of Structural Maladjustment **Robert J. Gordon**

NBER Working Paper No. 5739

September 1996

JEL Nos. E30, E50, E60

Economic Fluctuations and Growth

This paper analyzes two-way interactions between structural reform and macroeconomic policy. If structural reforms increase the flexibility of labor markets, then they are likely to improve the short-run inflation–unemployment trade-off, providing an incentive for policymakers to expand aggregate demand. In turn, the promise by policymakers

that they will encourage a decline in unemployment in response to good news on inflation can be used to strike a deal with political interests opposed to the introduction or extension of structural reform. Expansionary monetary policy also provides relief on the fiscal front, both directly by bringing the actual budget deficit closer to the structural budget deficit, and indirectly by encouraging structural reform, potentially reducing the structural budget deficit itself.

In 1992–3 several European countries dropped out of the Exchange Rate Mechanism to pursue more expansionary monetary policies. The difference in the performance of these countries versus those countries that maintained a peg between their currencies and the Deutsche mark provides an important test case of the consequences of expansionary monetary policy. By 1995 the depreciating nations enjoyed a substantial relative acceleration of nominal GDP and, surprisingly, an even greater deceleration of inflation; their growth rate of real GDP accelerated more than their growth rate of nominal GDP in relation to the pegging countries. The continued deceleration of inflation in the depreciating countries shows that their natural unemployment rate has declined and that expansionary monetary policy has interacted beneficially with structural reform.

Prices, Tobacco Control Policies, and Youth Smoking

Frank J. Chaloupka and Michael Grossman

NBER Working Paper No. 5740
September 1996

JEL No. I1

Health Economics

This paper examines how effective in discouraging cigarette smoking among youths are several

tobacco control policies including: increased cigarette excise taxes (which result in higher cigarette prices); restrictions on smoking in public places and at private work-sites; and limits on the availability of tobacco products to youths. We use data from the 1992, 1993, and 1994 surveys of eighth-, tenth-, and twelfth-grade students conducted by the University of Michigan's Institute for Social Research as part of the Monitoring the Future Project. We add site-specific cigarette prices and measures of tobacco-related policies to the survey data. The results indicate that tobacco control policies can be effective in reducing youth cigarette smoking. The average overall estimated price elasticity of youth cigarette demand of -1.313 indicates that large increases in cigarette excise taxes would lead to sharp reductions in youth smoking. Similarly, strong restrictions on smoking in public places would reduce the prevalence of smoking among youths, while limits on smoking in schools would reduce average cigarette consumption among young smokers. However, limits on youth access to tobacco products appear to have little impact on youth cigarette smoking. This is most likely the result of the relatively weak enforcement of these laws.

How to Count Patents and Value Intellectual Property: Uses of Patent Renewal and Application Data

Jean O. Lanjouw, Ariel Pakes, and Jonathan Putnam

NBER Working Paper No. 5741
September 1996

JEL Nos. O30, C81, L10

Productivity

Patent counts are very imperfect measures of innovative output. This paper discusses how additional data—the number of years a patent is renewed and the number of coun-

tries in which protection for the same invention is sought—can be used to improve on counts in studies that require a measure of the extent of innovation. We propose a simple renewal-based weighting scheme that may remove half of the noise in patent counts as a measure of innovative output. The paper also illustrates how these data can be used to estimate the value of the proprietary rights created by the patent laws. The parameters estimated in this analysis can be used to answer a series of questions related to the value of patents. We illustrate with estimates of how the value of patent protection would vary under alternative legal rules and renewal fees, and with estimates of the international flows of returns from the patent system. Recent progress in the development of databases has increased the potential for this type of analysis.

International Capital Mobility in History: Purchasing Power Parity in the Long Run

Alan M. Taylor

NBER Working Paper No. 5742
September 1996

JEL Nos. N20, F30

International Finance and Macroeconomics, Development of the American Economy

This paper investigates purchasing power parity (PPP) since the late nineteenth century for a sample of 20 countries, a broader sample of pooled annual data than has been studied before. Econometric results for time-series and panel samples allow us to test the robustness of the PPP hypothesis in different eras: the gold standard, interwar, Bretton Woods, and the recent float. The evidence for PPP is mixed: strong PPP, entailing stationarity of the real exchange rate, is not supported broadly, and real-exchange-rate dis-

persion exhibits counterintuitive historical patterns. However, not-much-weaker forms of PPP can be supported, with evidence of cointegration among different countries' common-currency price levels. Residual variances confirm the conventional wisdom that the interwar period, particularly the Great Depression, represented the nadir of international capital market integration in the modern era.

International Capital Mobility in History: The Saving-Investment Relationship

Alan M. Taylor

NBER Working Paper No. 5743

September 1996

JEL Nos. F30, N20

International Finance and Macroeconomics, Development of the American Economy

Economic historians have been concerned with the evolution of international capital markets over the long run, but empirical testing of market integration has been limited. This paper augments the literature by investigating long- and short-run criteria for capital mobility, using time-series and cross-section analysis of the saving-investment correlation for 12 countries since 1850. The results present a nuanced picture of capital market evolution. The sample shows considerable cross-country heterogeneity. Broadly speaking, the interwar period, and especially the Great Depression, emerge as an era of diminishing capital mobility. Only recently can we observe a tentative return to the degree of capital mobility witnessed during the late nineteenth century.

The Proper Scope of Government: Theory and an Application to Prisons

Oliver Hart, Andrei Shleifer, and Robert W. Vishny

NBER Working Paper No. 5744

September 1996

JEL Nos. O23, H11

Corporate Finance, Public Economics

When should a government provide a service "in-house" and when should it contract out? We develop a model in which the provider can invest in improving the quality of service or in reducing cost. If contracts are incomplete, then the private provider has a stronger incentive to engage in both quality improvement and cost reduction than a government does. However, the private contractor's incentive to engage in cost reduction is typically too strong, because he ignores the adverse effect on noncontractible quality. We apply the model to understanding the costs and benefits of prison privatization.

Auction Design and the Market for Sulfur Dioxide Emissions

Paul L. Joskow, Richard Schmalensee, and Elizabeth M. Bailey

NBER Working Paper No. 5745

September 1996

JEL No. D44

Industrial Organization

Title IV of the Clean Air Act Amendments of 1990 created a market for electric utility emissions of sulfur dioxide (SO₂). Recent papers have argued that flaws in the design of the auctions that are part of this market have affected its performance adversely. However, these papers incorrectly assume that trade can occur only at auctions. Our empirical analysis of the SO₂ emissions market shows that the auctions have become a small part of a relatively efficient market and that the auction

design problems that have attracted the most attention have had no effect on actual market prices.

Environmental Change and Hedonic Cost Functions for Automobiles

Steven Berry, Samuel Kortum, and Ariel Pakes

NBER Working Paper No. 5746

September 1996

JEL Nos. D2, D24, L62

Industrial Organization, Productivity

This paper focuses on how changes in the economic and regulatory environment have affected production costs and product characteristics in the automobile industry. We estimate "hedonic cost functions" that relate product-level costs to their characteristics. Then we examine how this cost surface has changed over time and how these changes relate to changes in gas prices and in emission standard regulations. We also briefly consider the related questions of how changes in automobile characteristics, and in the rate of patenting, are related to regulations and gas prices.

Issues in Korean Exchange Rate Policy

Stanley W. Black

NBER Working Paper No. 5747

September 1996

JEL No. F3

Korea faces a number of unique problems that affect its exchange rate policy. Among these are its asymmetric competitive position vis-à-vis Japan, which is both its major supplier of machine tools and a leading competitor in third markets; the current policy of financial liberalization that goes along with democratic liberalization; and the implications of the potential future unification of the Korean peninsula. This paper considers the question of exchange rate policy for Korea in the face of fluctuations in the yen/dollar rate,

increasing competition from lower-cost Asian countries, and financial liberalization. The paper deals with external versus internal targets, choice of external comparison basket, and the effects of financial liberalization. I analyze the Korean choice of an independent exchange rate policy in terms of the trade-off between external shocks and inflation-fighting credibility of the central bank. Financial liberalization brings with it increased capital mobility. I also consider the possibility of a regional currency area, Korean unification, and long-run equilibrium.

The Equilibrium Approach to Exchange Rates: Theory and Tests

Prakash Apte, Piet Sercu, and Raman Uppal

NBER Working Paper No. 5748

September 1996

JEL No. F31

We characterize the equilibrium exchange rate in a general equilibrium economy without imposing strong restrictions on the output processes, preferences, or commodity market imperfections. The nominal exchange rate is determined by differences in initial wealths—the currencies of richer countries tend to be overvalued by purchasing power parity (PPP) standards—and by differences in marginal indirect utilities of total nominal spending. Changes in the exchange rate mirror differences in growth rates of real spending weighted by relative risk aversion (which can vary over time and can differ across countries), and in the case of nonhomothetic utility functions, differences in inflation rates computed from marginal spending weights. Thus, standard regression or cointegration tests of PPP suffer from missing-variables biases and ignore variations in risk aversions across countries and over time. We also present cointegration

tests of the version of the model with constant relative risk aversion (CRRA) and homothetic preferences. When nominal spending is given an independent role (next to prices) in the short-term dynamics, both PPP and the CRRA model become acceptable.

Exchange Rate Pass-Through and Industry Characteristics: The Case of Taiwan's Exports of Midstream Petrochemical Products

Kuo-Liang Wang and Chung-Shu Wu

NBER Working Paper No. 5749

September 1996

JEL Nos. F31, F12, L1

Based on 1986–92 survey data of 22 midstream petrochemical industries in Taiwan, we show that Taiwan's petrochemical firms absorb only a small portion of a given weighted exchange rate change in their export prices, markup ratios, and price–cost margins. This implies that Taiwan's petrochemical firms have a weak pricing-to-market pattern. These empirical results may be explained by the volatility of profitability, high market concentration, and small export/domestic production share. However, the impacts of the exchange rate change on the export price, markup ratio, and price–cost margin have a tendency to increase during 1987 to 1992. The tendency might be attributed to increasing competition of the petrochemical markets in the world, or to Taiwanese firms' gradual realization of the importance of holding their world market shares in response to the change in the exchange rate.

Are Medical Prices Declining?

David M. Cutler, Mark McClellan, Joseph P. Newhouse, and Dahlia Remler

NBER Working Paper No. 5750

September 1996

Aging, Productivity, Public Economics

We address long-standing problems in measuring health care prices by estimating two indexes of the price of medical care. The first, a Service Price Index, prices specific medical services, as does the current Consumer Price Index (CPI). The second, a Cost-of-Living Index, measures the net valuation of treating a health problem. We apply these indexes to heart attack treatment between 1983 and 1994. We find that because of technological change and increasing discounts, the current CPI overstates a chain-weighted price index by 3 percentage points annually. For plausible values of an additional year of life, the real Cost-of-Living Index fell by about 1 percent annually.

The Determinants of Technological Change in Heart Attack Treatment

David M. Cutler and Mark McClellan

NBER Working Paper No. 5751

September 1996

Aging, Health Care, Productivity, Public Economics

This paper examines the sources of expenditure growth in heart attack treatment. First we show that essentially all of the cost growth is a result of the diffusion of particular intensive technologies; the prices paid for a given level of technology have been constant or falling over time. Then we examine the reasons for this diffusion of technology and distinguish six factors that may influence it: organizational factors within hospitals; the insurance environment in which technology is reimbursed;

public policy regulating new technology; malpractice concerns; competitive or cooperative interactions among providers; and demographic composition. We conclude that insurance variables, technology regulation, and provider interactions have the largest quantitative effect on technological diffusion. These factors affect both technology acquisition and the frequency of technology use.

Heterogeneous Information Arrivals and Return Volatility Dynamics: Uncovering the Long Run in High-Frequency Returns

Torben G. Andersen and Tim Bollerslev

NBER Working Paper No. 5752
September 1996
JEL Nos. C22, C51, E44
Asset Pricing

Recent empirical evidence suggests that the long-run dependence in financial market volatility is characterized best by a slowly mean-reverting fractionally integrated process. At the same time, much shorter-lived volatility dependencies typically are observed with high-frequency intradaily returns. In rationalizing this behavior, this paper draws on the information arrival, or mixture-of-distributions hypothesis interpretation of the latent volatility process. By interpreting the overall volatility as the manifestation of numerous heterogeneous information arrivals, sudden bursts of volatility typically will have both short-run and long-run components. Over intradaily frequencies, the short-run decay stands out most clearly, while the impact of the highly persistent processes will be dominant over longer horizons. These ideas are confirmed by our empirical analysis of a one-year time series of intradaily five-minute Deutschemark-U.S. dol-

lar returns. Whereas traditional time-series-based measures for the temporal dependencies in the absolute returns give rise to very conflicting results across different intradaily sampling frequencies, the corresponding semiparametric estimates for the order of fractional integration remain remarkably stable. Similarly, the autocorrelogram for the low-pass filtered absolute returns, obtained by annihilating periods of more than one day, exhibit a striking hyperbolic rate of decay.

The Government as Venture Capitalist: The Long-Run Impact of the SBIR Program

Josh Lerner

NBER Working Paper No. 5753
September 1996
Productivity

Public programs to provide early-stage financing to firms, particularly high-technology companies, have become commonplace in the United States and abroad. However, the long-run effectiveness of these programs has attracted little empirical scrutiny. This paper examines the impact of the largest U.S. public venture capital initiative, the Small Business Innovation Research (SBIR) program, which has provided over \$6 billion to small high-technology firms between 1983 and 1995. Using a unique database of awardees compiled by the U.S. General Accounting Office, I show that SBIR awardees grew significantly faster than a matched set of firms over a ten-year period. The positive effects of SBIR awards were confined to firms based in zip codes with substantial venture capital activity. These findings are consistent with both the corporate finance literature on capital constraints and the growth literature on the importance of localization effects.

Fixing Capital Gains: Symmetry, Consistency, and Correctness in the Taxation of Financial Instruments

David F. Bradford

NBER Working Paper No. 5754
September 1996
JEL No. H24
Public Economics

An enormous amount of effort and ingenuity has been addressed to patching holes in the income tax attributable to realization accounting. A classic instance of the problem is the headaches created by capital gains, whereby the taxpayer can choose to postpone recognition of gain and accelerate recognition of loss (a practice known as cherry picking). Nowhere are the inconsistencies that result from realization accounting more pronounced than in the taxation of financial instruments, especially "derivatives" of familiar securities. This paper sets forth the requirements for income measurement rules based on realization that are "linear," in the sense that doubling a person's transactions will double the taxable income, while adding one set of transactions to another will result in the sum of the associated income. Under present realization conventions, the tax law cannot be linear, because then there would be no limit on tax arbitrage profit via variations on borrowing with deductible interest and lending tax exempt. To focus on the principles, I assume in this paper that transactions are costless. In that case, I show that to deal with the intertemporal aspect of the problem requires virtually universal imputation of taxable interest income to basis (the taxpayer's cost of an asset). To deal with the risk aspect of the problem (lock-in and cherry picking) requires simply that the effective rate of tax on gains and losses be the same (not necessarily

equal to the rate on intertemporal returns). I propose a new method that satisfies the requirements for linear income measurement. I show that the retroactive taxation of gain devised by Alan J. Auerbach is a special case of the new approach (involving a zero effective rate of tax on gains and losses).

**“Basket” Cases:
International Joint
Ventures After the Tax
Reform Act of 1986**

**Mihir A. Desai and
James R. Hines, Jr.**

NBER Working Paper No. 5755
September 1996
JEL Nos. H87, F23, H25, L23
Public Economics

This paper examines the impact of the Tax Reform Act of 1986 (TRA) on international joint ventures by American firms. The evidence suggests that TRA had a significant effect on the organizational form of U.S. business activity abroad. The TRA mandates the use of separate “baskets” in calculating foreign tax credits on income received from foreign corporations owned 50 percent or less by Americans. This limitation on worldwide averaging greatly reduces the attractiveness of joint ventures to American investors, particularly ventures in low-tax foreign countries. Aggregate data indicate that U.S. participation in international joint ventures fell sharply after 1986. The decline in U.S. joint venture activity is most pronounced in low-tax countries; this is consistent with the incentives created by the TRA. Moreover, joint ventures in low-tax countries use more debt and pay greater royalties to their U.S. parents after 1986, which reflects their incentives to economize on dividend payments.

**The Determinants of the
Choice Between Fixed
and Flexible Exchange
Rate Regimes**

Sebastian Edwards

NBER Working Paper No. 5756
September 1996
JEL Nos. F31, F32, F33
International Finance and
Macroeconomics

In recent years, analysts and policymakers have been evaluating the nexus between exchange rates and macroeconomic stability. Among the most important questions asked is why some countries have adopted rigid—including fixed—exchange rate regimes, while others have opted for more flexible systems. This paper addresses this question from a political economy perspective, both theoretically and empirically.

The model assumes that the monetary authority minimizes a quadratic loss function that captures the trade-off between inflation and unemployment. This framework is applied initially to the case in which monetary authorities must choose between a (permanently) fixed and a flexible exchange rate regime. In selecting the regime, the authorities supposedly compare the expected losses under each scenario. The model subsequently is extended to cover the somewhat more complicated case in which the authorities must choose between fixed-but-adjustable and flexible exchange rate regimes. In this latter case, I take into account the potential political costs of abandoning the pegged rate. In the empirical section of the paper I use an unbalanced panel dataset of 63 countries from 1980–92 to estimate a series of probit models, with a binary exchange rate regime index as the dependent variable. Among the most important explanatory variables are measures of countries’ historical degrees of political instability,

various measures of the probability of abandoning pegged rates, and variables related to the relative importance of real (unemployment) targets in the preferences of monetary authorities. The regression results support the political economy approach developed in the theoretical discussion.

**The Macroeconomics
of Specificity**

**Ricardo J. Caballero and
Mohamad L. Hammour**

NBER Working Paper No. 5757
September 1996
JEL Nos. E1, O10, D52
Economic Fluctuations and Growth

Specific quasi-rents build up in a wide variety of economic relationships, and are exposed to opportunism unless they are protected fully by contract. The recognition that such contracts are often incomplete has yielded major insights into the organization of microeconomic exchange. Rent appropriation, we argue, also has important *macroeconomic* implications. Resources are underutilized, factor markets are segmented, production suffers from technological “sclerosis,” job destruction is out of balance with creation, recessions are excessively sharp, and expansions run into bottlenecks. Depending on the nature of the shock, expansions may require reinforcement or stabilization, but recessions always should be softened. In the long run, institutions—such as those governing capital–labor relations—may evolve to alleviate the problem by balancing appropriation. Technology choice also will be affected, with the appropriated factor partially “excluding” the other from production to reduce appropriation. This is manifested in the role that capital–labor substitution played in the rise of European unemployment.

Financial Dependence and Growth

Raghuram G. Rajan and Luigi Zingales

NBER Working Paper No. 5758

September 1996

Corporate Finance,

Economic Fluctuations and Growth

Does finance affect economic growth? A number of studies have identified a positive correlation between the level of development of a country's financial sector and the rate of growth of its per capita income. As has been noted elsewhere, the observed correlation does not necessarily imply a causal relationship. This paper asks whether financial development facilitates economic growth by scrutinizing one rationale for such a relationship: financial development reduces the costs of external finance to firms. Specifically, we ask whether industrial sectors that are relatively more in need of external finance develop disproportionately faster in countries with more developed financial markets. We find this to be true in a large sample of countries over the 1980s. We show that this result is not likely to be driven by omitted variables, outliers, or reverse causality.

The Effects of Tax-Based Saving Incentives on Saving and Wealth

Eric M. Engen, William G. Gale, and John Karl Scholz

NBER Working Paper No. 5759

September 1996

JEL Nos. H31, E21, H24

Public Economics

This paper evaluates existing research on the effects of tax-based saving incentives on private and national saving. Several factors make this an unusually difficult problem: First, households that participate in, or are eligible for, saving incentive plans have systematically stronger tastes for saving than other house-

holds. Second, the data indicate that households with saving incentives have taken on more debt than other households. Third, significant changes in the 1980s in financial markets, pensions, Social Security, and nonfinancial assets interacted with the expansion of saving incentives. Fourth, saving incentive accounts represent pretax balances, whereas conventional taxable accounts represent posttax balances. Fifth, the fact that employer contributions to saving incentive plans are a part of total employee compensation typically is ignored.

A major theme of this paper is that analyses that ignore these issues overstate the impact of saving incentives on saving. We show that accounting for these factors largely or completely eliminates the estimated positive impact found in the literature of saving incentives on saving. Thus, we conclude that little if any of the overall contributions to existing saving incentives have raised private or national saving.

Mortality Contingent Claims, Health Care, and Social Insurance

Tomas Philipson and Gary S. Becker

NBER Working Paper No. 5760

September 1996

JEL No. I01

Health Care

This paper analyzes the impacts on savings and health care of *mortality contingent claims*, defined here as income measures, such as annuities and life insurance, under which earned income is contingent on the length of one's life. The post-war increase in mandatory annuity and life insurance programs, as well as the rapid increase in life expectancy, motivates a better understanding of the effects that mortality contingent claims have on resources devoted to life extension. We ana-

lyze the incentives that such claims imply for life extension when resources may affect mortality endogenously, and we argue that these incentives dramatically alter the standard conclusions obtained when mortality is treated exogenously.

The Transition Path in Privatizing Social Security

Martin Feldstein and Andrew Samwick

NBER Working Paper No. 5761

September 1996

JEL No. H55

Public Economics

This paper analyzes the transition from the existing pay-as-you-go Social Security program to a system of funded Mandatory Individual Retirement Accounts (MIRAs). Because of the high return on real capital relative to the very low return in a mature pay-as-you-go program, the benefits that can be financed with the existing 12.4 percent payroll tax eventually could be funded with mandatory contributions of only 2.1 percent of payroll. A transition to that fully funded program could occur with a surcharge of less than 1.5 percent of payroll during the early part of the transition. After 25 years, the combination of financing the pay-as-you-go benefits and accumulating the funded accounts would require less than the current 12.4 percent of payroll. The paper also discusses how a MIRA system could deal with the benefits of low-income employees and with the risks associated with uncertain longevity and fluctuating market returns.

Individual Financial Decisions in Retirement Saving Plans and the Provision of Resources for Retirement

James M. Poterba and David A. Wise

NBER Working Paper No. 5762

September 1996

JEL Nos. J14, H55, E21

Aging, Public Economics

Proposals for mandatory private savings accounts differ in the degree of investment discretion provided to individual savers, and in their provisions for annuitization of accumulated assets. With respect to investment choices, some argue that individuals must be prevented from investing too conservatively and earning low returns over their accumulation period; others argue that individuals should be protected from recklessly investing their retirement assets. With respect to annuitization, there is concern that individuals might not choose annuities and thereby would expose themselves to a risk of outliving their assets in a privatized system. This paper draws on the existing experience with 401(k) plans and other defined-contribution pension plans to provide evidence on each of these issues. We find that the share of 401(k) plan assets held in corporate equities has increased substantially in recent years. We are able to provide only limited evidence on participant asset management, since many 401(k) plans have limited options in this regard. We do find, however, that a participant's education and income levels are related to asset allocation decisions, with less-educated and lower-income participants less inclined to invest in equity securities. We also analyze a unique database on TIAA-CREF participants and find several attributes of annuitization behavior that seem inconsistent with standard behavior in the life-cycle model.

The Wages and Language Skills of U.S. Immigrants

Geoffrey Carliner

NBER Working Paper No. 5763

September 1996

JEL Nos. J31, J15

Labor Studies

This paper finds that immigrants on average earned about 50 cents an hour less than native-born Americans in 1989. Immigrants from some regions earned considerably more than natives, while others, especially from Mexico, earned much less. This paper also finds that when immigrants first arrive in the United States they earn significantly less than native workers, but that they close the gap by about 0.8 percentage points with each added year of residence. As a result, the wage of the typical immigrant who arrived in the 1950s and 1960s eventually surpassed the average native wage. Improvements in English language skills contributed anywhere from 6 to 18 percent of this narrowing, depending on the sex and education level of the immigrant. The remainder came from unmeasured sources of assimilation.

However, since the 1950s and 1960s the wage gap between natives and newly arrived immigrants has widened by 0.2 to 0.6 percentage points annually. Because they start with a larger disadvantage, the more recent immigrants may never see their average wage exceed the average native wage. A decline in the average education of newly arrived immigrants accounts for 4 to 23 percent of the starting wage gap, and shifts in the source countries of new immigrants from Europe to Latin America and Asia account for 73 to 95 percent. Changes in English skills and in other factors have played little role in this relative decline.

This analysis also finds a significant return to skills in English. Even after controlling for education,

region of origin, and years of U.S. residence, I find that workers are rewarded for speaking English well. Differences among each of the five English skill categories reported in the Census data are about the same as the return to an additional year of schooling.

What Does the Bundesbank Target?

Ben S. Bernanke and Ilian Mihov

NBER Working Paper No. 5764

September 1996

Economic Fluctuations and Growth, Monetary Economics

Although its primary ultimate objective is price stability, the Bundesbank has drawn a distinction between its money-focus strategy and the inflation-targeting approach recently adopted by a number of central banks. Holding constant the current forecast of inflation, we show that German monetary policy responds very little to changes in forecasted money growth; we conclude that the Bundesbank is much better described as an inflation targeter than as a money targeter.

This paper also applies our (1995) structural vector autoregression methods to a determination of the optimal indicator of German monetary policy. We find that the Lombard rate historically has been a good policy indicator, although the use of the call rate as an indicator cannot be rejected statistically.

Nonmonetary Exchange Within Firms and Industry **Canice Prendergast and Lars Stole**

NBER Working Paper No. 5765

September 1996

JEL Nos. D8, J3, L1

Labor Studies

This paper considers why firms choose nonmonetary means of exchange, such as barter and the reciprocation of favors, despite the usual benefits of monetary transactions. We consider the chosen means of exchange when both monetary and nonmonetary exchange mechanisms are available. We illustrate three potential reasons for the emergence of nonmonetary trade. First, a willingness to barter may reveal information that cannot be revealed solely through monetary trade. Second, nonmonetary trade may constrain the ability of agents to engage in inefficient rent-seeking activities. Finally, nonmonetary trade improves the ability of agents to impose trade sanctions on those who act dishonestly. We consider a number of applications of each of these ideas.

A Model of Foreign Exchange Rate Indetermination

Charles M. Engel

NBER Working Paper No. 5766

September 1996

JEL No. F40

International Finance and
Macroeconomics

Economic agents undertake actions to protect themselves from the short-run impact of foreign exchange rate fluctuations: nominal goods prices are set in consumers' currencies, and firms hedge foreign exchange risk. I present a model that shows that these features of the economy can lead to indeterminacy in the nominal exchange rate in the short run. There can be noise in the

exchange rate, unrelated to any fundamentals, essentially because the short-run fluctuations do not influence any rational agent's behavior. I explore empirical implications of this sort of noise.

Aggregate Employment Fluctuations with Microeconomic Asymmetries

**Jeffrey R. Campbell and
Jonas D. M. Fisher**

NBER Working Paper No. 5767

September 1996

JEL No. E1

Economic Fluctuations and Growth

We provide a simple explanation for the observation that the variance of job destruction is greater than the variance of job creation: job creation is costlier at the margin than job destruction. As Caballero has argued, asymmetric employment adjustment costs at the establishment level need not imply asymmetric volatility of aggregate job flows. We construct an equilibrium model in which certain employment policies respond endogenously to aggregate shocks. The microeconomic asymmetries in the model can dampen the response of total job creation to an aggregate shock, and can cause it to be less volatile than total job destruction. This is so even though aggregate shocks are distributed symmetrically.

Trade and Environment Beyond Singapore

John Whalley

NBER Working Paper No. 5768

September 1996

International Trade and Investment

This paper discusses the likely evolution of the trade-and-environment issue in the World Trade Organization (WTO) after the upcoming ministerial meeting in Singapore this December. It makes a number of points: first, progress within the GATT/WTO on this issue

is likely to be slow and painfully incremental, rather than bold, as environmental groups wish. Second, despite (and beyond) Singapore, one has to go further than the GATT/WTO to see the potential evolution of the trade-and-environment issue. In the next few years, developments are likely to be driven as much by factors outside the GATT/WTO as within it, as new global environmental arrangements—some with potentially large trade implications (such as carbon emission limitation agreements)—emerge.

Do Markets Respond More to More Reliable Labor Market Data? A Test of Market Rationality

Alan B. Krueger

NBER Working Paper No. 5769

September 1996

JEL Nos. G14, J10

Labor Studies

Since 1979, the Bureau of Labor Statistics (BLS) has nearly quadrupled the size of the sample used to estimate monthly employment changes. Although first-reported employment estimates are still noisy, the magnitude of sampling variability has declined in proportion to the increase in the sample size. A model of rational Bayesian updating predicts that investors would assign more weight to the BLS employment survey as it became more precise. However, a regression analysis of changes in interest rates on the day the employment data are released finds no evidence that the bond market's reaction to employment news intensified in the late 1980s or early 1990s. For the time period as a whole, an unexpected increase of 200,000 jobs is associated with an 8-basis-point increase in the interest rate on 30-year Treasury bonds, and a 9-basis-point increase in the interest rate on 3-month bills, all else

equal. Additionally, announced increases in the hourly wage are associated with higher long-term interest rates, while announced changes in the unemployment rate and revisions to past months' employment estimates have a statistically insignificant effect on long-term interest rates.

Estimating the Welfare Effects of Digital Infrastructure

Shane M. Greenstein and Pablo T. Spiller

NBER Working Paper No. 5770
September 1996
JEL Nos. L51, L96, O30
Productivity

While much economic policy presumes that more information infrastructure yields higher economic returns, little empirical work measures the magnitudes of these returns. We examine investment by local exchange telephone companies in fiber optic cable, ISDN lines, and signal seven software; this infrastructure plays an essential role in bringing digital technology to local telephone networks. We estimate the elasticity of the derived demand for infrastructure investment faced by local exchange companies, controlling for factors such as local economic activity and the political disposition of state regulators. Our model postulates a regulated profit-maximizing local exchange firm and a regulatory agency with predetermined political leanings in favor of consumer prices or firm profits. The model accounts for variation in state regulation and local economic conditions.

In all our estimates, we find that consumer demand is sensitive to investment in modern infrastructure, particularly as represented by fiber optic cable. Our estimates imply that infrastructure investment is responsible for a substantial fraction of the

recent growth in consumer surplus and business revenue in local telecommunication services.

The Exchange Value of the Renminbi and China's Balance of Trade: An Empirical Study

Zhaoyong Zhang

NBER Working Paper No. 5771
September 1996
JEL Nos. F31, F14, P22

This paper uses some recent econometric techniques designed to evaluate the existence and the direction of causality to assess the relationship between the exchange value of the Chinese Renminbi (RMB) and China's trade balance. I find that changes in the trade balance and in each of its components "Granger-cause" changes in the exchange rate, but there is no evidence of a causal link running from the exchange rate to the trade balance. These results support the accommodative role of the exchange rate proposed by the modern theory of trade balance determination; they do not support the existence of a J-curve in China's trade balance. The bidirectional causal relationship between the real exchange rate and the price variables confirms the presence of a "vicious circle" following currency devaluation. This has important implications for the impacts of RMB devaluation on China's trade balance.

Debt, Cash Flow, and Inflation Incentives: A Swedish Example

Mats Persson, Torsten Persson, and Lars E. O. Svensson

NBER Working Paper No. 5772
September 1996
JEL Nos. E31, E62, H62, H63
International Finance and Macroeconomics, Monetary Economics, Public Economics

The fiscal gains from, and hence the political incentives for, an increase in the inflation rate of 10 percentage points may be substantial: with Swedish data from 1994, these gains are estimated at an annual real flow of 3–4 percent of GDP, or a capitalized value of nearly 100 percent of GDP. They would have arisen mainly from the nominalistic features of the tax and transfer systems, rather than from the traditional sources: seignorage and real depreciation of the public debt. The welfare costs of such an increase in inflation would have been even larger, however, and thus would have reduced net welfare. We present and discuss possible institutional reforms aimed at making the political costs of inflation more equal to the social costs.

Diffusion of General Purpose Technologies

Elhanan Helpman and Manuel Trajtenberg

NBER Working Paper No. 5773
September 1996
JEL Nos. O10, O30, O41, E32
Productivity

History and theory alike suggest that General Purpose Technologies (GPTs), such as the steam engine or electricity, may play a key role in economic growth. In a previous paper (1994) we incorporated this notion into a Grossman–Helpman growth model, and explored the economywide dynamics that a GPT generates. This paper deals with the

diffusion of the GPT over heterogeneous final-good sectors. We show that the gradual adoption of the GPT by each user sector generates a sequence of two-phased cycles, culminating in a "second wave": after all sectors adopt, they again engage in R and D, bringing about a spell of sustained growth. We also analyze the welfare implications of the *order* of adoption, by way of numerical simulations. As a "reality check," we sketch the early diffusion of the transistor (the first embodiment of semiconductors, the dominant GPT of our era) and seek to characterize both the early adopters and the laggards in terms of the parameters of the model.

The Decline of Welfare Benefits in the United States: The Role of Wage Inequality

Robert Moffitt, David Ribar, and Mark Wilhelm

NBER Working Paper No. 5774
September 1996
JEL Nos. H72, I38
Public Economics

Welfare benefits in the United States have experienced a much-studied secular decline since the mid-1970s. We explore a new hypothesis for this decline related to the increase in wage inequality in the labor market and to the decline of real wages at the bottom of the distribution: we posit that voters prefer benefits that are tied to low-skilled wages. We test the hypothesis using a 1969–92 panel of state-level data. Our analysis also uses General Social Survey data on voter preferences for welfare, which we combine with Current Population Survey data to determine the voter in each state who has the median preferred level of welfare benefits. We find considerable evidence of a role for declining real wages in the decline of welfare benefits.

Driving Forces and Employment Fluctuations

Steven J. Davis and John C. Haltiwanger

NBER Working Paper No. 5775
September 1996
JEL Nos. E32, J63
Economic Fluctuations and Growth

We rely on a decomposition of changes in employment into job creation and job destruction components—and a novel set of identifying restrictions that this decomposition permits—to develop new evidence about the driving forces behind aggregate fluctuations and the channels through which they operate. We implement our approach using quarterly postwar U.S. data on oil shocks, monetary shocks, and manufacturing rates of job creation and destruction. Our analysis results in several inferences:

1. The data favor a characterization of fluctuations in employment and job reallocation involving many shocks.

2. In order to fit the data, theories of employment fluctuations that attribute a predominant role to aggregate shocks must involve contemporaneous effects on job destruction at least as large as the effects on job creation.

3. Theories in which aggregate shocks primarily affect the first moment of the cross-sectional density of employment growth imply that allocative shocks have bigger contemporaneous effects on destruction than on creation; hence, allocative shocks reduce aggregate employment.

4. Allocative shocks drive most fluctuations in the intensity of job reallocation.

5. Oil shocks drive employment fluctuations through a mixture of allocative and aggregate channels.

6. Monetary shocks trigger job creation and destruction dynamics that fit the profile of an aggregate shock.

Simulating the Privatization of Social Security in General Equilibrium

Laurence J. Kotlikoff

NBER Working Paper No. 5776
September 1996
JEL No. H55
Aging, Public Economics

This paper studies the macroeconomic and efficiency effects of privatizing Social Security. It does so by simulating alternative privatization schemes using the Auerbach–Kotlikoff Dynamic Life-Cycle Model. The simulations indicate three things. First, privatizing Social Security can generate very major long-run increases in output and living standards. Second, although the long-run gains from privatization are larger if privatization redistributes resources from initial to future generations, the pure efficiency gains from privatization are also substantial. (Efficiency gains refer to the welfare improvement available to future generations after existing generations have been compensated fully for their losses from privatization. The precise size of the efficiency gain depends on the existing tax structure, the linkage between benefits and taxes under the existing Social Security system, and the method chosen to finance benefits during the transition.) Third, at least in the long run, privatizing Social Security is likely to be progressive, in that it improves the well-being of the "lifetime poor" relative to that of the "lifetime rich."

Historical Factors in Long-Run Growth

Compulsory Schooling Legislation and School Attendance in Turn-of-the-Century America: A "Natural Experiment" Approach

Robert A. Margo and
T. Aldrich Finegan

NBER Historical Paper No. 89

July 1996

JEL No. N31

Recent research by Joshua D. Angrist and Alan B. Krueger has used information on exact dates of birth in the 1960 to 1980 federal Censuses to study the impact of compulsory schooling laws on school attendance. This paper modifies their methodology to analyze similar data in the 1900 federal Census to measure the impact of turn-of-the-century compulsory schooling laws. Using data on 14-year-olds from the 1900 Census public use microdata sample, we compare attendance rates of children born after January 1, 1900 with those born before that date, across states with and without compulsory schooling laws. In states that combined school-leaving with child labor laws, we find, compulsion significantly raised attendance rates.

What Determines the Allocation of National Government Grants to the States?

John Joseph Wallis

NBER Historical Paper No. 90

July 1996

JEL Nos. H77, N42

Public Economics

During the New Deal, the federal government initiated a policy of massive grants to states for support of social welfare and other pro-

grams. Since that time grants have come to be an integral part of the U.S. fiscal system, and scholars have continued to debate whether the allocation of federal grants among the states is motivated primarily by political, or by social and economic objectives. This paper shows that, during the 1930s, both political and economic effects determined grant allocation, but that the congressional factors considered by Anderson and Tollison were not important, while the presidential factors considered by Wright were. When I extend the analysis to 1932 to 1982, however, congressional influences do seem to be important. On the other hand, the dominant influence on federal grant policy over the longer sample appears to be state government expenditures, with both political and economic influences playing a smaller role.

"Location, Location, Location!" The Market for Vacant Urban Land: New York, 1835-1900

Jeremy Atack and
Robert A. Margo

NBER Historical Paper No. 91

August 1996

JEL No. R33

We present new archival evidence on the price of vacant land in New York City between 1835 and 1900. Before the Civil War, the price of land per square foot fell steeply with distance from New York's City Hall in the central business district (CBD). After the Civil War, the distance gradient flattened, and the fit of a simple regression of land price on distance from the CBD declined markedly. Average nominal land prices at the CBD increased at an average annual rate of over 3 percent per year between 1835 and 1895 before declining as the century came to an end.

Explaining the Rise in Antebellum Pauperism: New Evidence

Lynne L. Kiesling and
Robert A. Margo

NBER Historical Paper No. 92

September 1996

JEL No. N31

The 1850s witnessed one of the earliest "welfare explosions" in American history. During that decade the "pauper rate"—the proportion of individuals receiving public assistance—increased from 5.8 to 10.2, or 76 percent. Previous attempts to explain the increase in antebellum pauperism have been hampered by the available published data, which are too aggregated to be of much use.

This paper explores the determinants of antebellum pauperism using previously unexploited archival data drawn from the manuscript censuses of social statistics. These records provided detailed evidence on the incidence of pauperism at the county level. We find that about half of the increase in pauperism can be attributed to falling real wages during the decade. Other contributing factors were increased immigration and urbanization.

Technical Papers

Asymptotics for GMM Estimators with Weak Instruments

James H. Stock and
Jonathan Wright

NBER Technical Paper No. 198

July 1996

JEL Nos. C1, C3

Asset Pricing,

Economic Fluctuations and Growth

This paper develops asymptotic distribution theory for generalized-method-of-moments (GMM) estima-

tors and test statistics, given that some of the parameters are identified well, but others are identified poorly because of weak instruments. The asymptotic theory entails applying empirical process theory in order to obtain a limiting representation of the (concentrated) objective function as a stochastic process. The general results are then specialized to two leading cases: linear instrumental variables regression, and GMM estimation of Euler equations obtained from the consumption-based capital asset pricing model with power utility. Numerical results from the latter model confirm that finite sample distributions can deviate substantially from normality. These deviations are captured by the weak instrument asymptotic approximations.

An Introduction to Applicable Game Theory

Robert Gibbons
NBER Technical Paper No. 199
August 1996
JEL Nos. C72, D82
Labor Studies

This paper offers an introduction to game theory for applied economists. I try to give simple definitions and intuitive examples of the basic kinds of games and their solution concepts. There are four kinds of games: static or dynamic, and complete or incomplete information. ("Complete information" means there is no private information.) The corresponding solution concepts are: Nash equilibrium in static games of complete information; backward induction (or subgame-perfect Nash equilibrium) in dynamic games of complete information; Bayesian Nash equilibrium in static games with incomplete information; and perfect Bayesian (or sequential) equilibrium in dynamic games with incomplete information. The main theme of the paper is that these solu-

tion concepts are closely linked. As we consider progressively richer games, we progressively strengthen the solution concept, to rule out implausible equilibria in the richer games that would survive if we applied the solution concepts available for simpler games. In each case, the stronger solution concept differs from the weaker concept only for the richer games, not for the simpler games.

Nonparametric Applications of Bayesian Inference

**Gary Chamberlain and
Guido W. Imbens**
NBER Technical Paper No. 200
August 1996
Labor Studies

This paper evaluates the usefulness of a nonparametric approach—attributable to Ferguson (1973, 1974) and Rubin (1981)—to Bayesian inference. We present two applications: The first considers a problem of educational choice. We focus on obtaining a predictive distribution for earnings corresponding to various levels of schooling. This predictive distribution incorporates the parameter uncertainty, so that it is relevant for decisionmaking under uncertainty in the expected utility framework of microeconomics. The second application is to quantile regression. Our point here is to examine the potential of the nonparametric framework to provide inferences without making asymptotic approximations. Unlike in the first application, the standard asymptotic normal approximation turns out not to be a good guide. We also consider a comparison with a bootstrap approach.

Asymptotically Median Unbiased Estimation of Coefficient Variance in a Time-Varying Parameter Model

**James H. Stock and
Mark W. Watson**
NBER Technical Paper No. 201
August 1996
Monetary Economics

This paper considers the estimation of the variance of coefficients in time-varying parameter models with stationary regressors. The maximum likelihood estimator (MLE) has large point mass at zero. We therefore develop asymptotically median unbiased estimators and confidence intervals by inverting median functions of regression-based parameter stability test statistics, computed under the constant-parameter null. These estimators have good asymptotic relative efficiencies for small to moderate amounts of parameter variability. We apply these results to an unobserved components model of trend growth in postwar U.S. GDP: the MLE implies that there has been no change in the trend rate, while the upper range of the median-unbiased point estimates implies that the annual trend growth rate has fallen by 0.7 percentage points over the postwar period.

Imposing Moment Restrictions from Auxiliary Data by Weighting

**Guido W. Imbens and
Judith K. Hellerstein**
NBER Technical Paper No. 202
August 1996
Labor Studies

In this paper we analyze estimation of coefficients in regression models under moment restrictions that are derived from auxiliary data. Our approach is similar to those that

have been used in statistics for analyzing contingency tables with known marginals. These techniques are useful in cases in which data from a small, potentially nonrepresentative dataset can be supplemented with auxiliary information from another dataset that may be much larger and/or more representative of the target population of interest. The moment restrictions yield weights for each observation that subsequently can be used in weighted regression analysis. We discuss the interpretation of these weights both under the assumption that the target population (from which the moments are constructed) and the sampled population (from which the sample is drawn) are the same, as well as under the assumption that these populations differ.

We present an application based on omitted ability bias in estimation of wage regressions. The National Longitudinal Survey (NLS) Young Men's Cohort, in addition to containing information for each observation on earnings, education, and experience, records data on two test scores that may be considered proxies for ability. The NLS is a small dataset, however, with a high attrition rate. We investigate how to mitigate these problems in the NLS by forming moments from the joint distribution of education, experience, and earnings in the 1 percent sample of the 1980 U.S. Census, and using these moments to construct weights for weighted regression analysis of the NLS. We analyze the impacts of our weighted regression techniques on the estimated coefficients and standard errors on returns to education and experience in the NLS controlling for ability, with and without the assumption that the NLS and the Census samples are random samples from the same population.

Statistical Mechanics Approaches to Socioeconomic Behavior

Steven N. Durlauf

NBER Technical Paper No. 203

September 1996

JEL Nos. D1, E1, I3

Economic Fluctuations and Growth,
Labor Studies

This paper provides a unified framework for interpreting a wide range of interactions models that have appeared in the economics literature. A formalization taken from the statistical mechanics literature encompasses a number of socioeconomic phenomena ranging from out-of-wedlock births to aggregate output to crime. The framework bears a close relationship to econometric models of discrete choice, and therefore holds the potential for rendering interactions models estimable. I suggest a number of new applications of statistical mechanics to socioeconomic problems.



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