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In This Issue

Program Report

Industrial Organization

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The NBER Program in Industrial Organization (IO), established in 1991, promotes applied economic research on a broad set of questions relating to firm behavior, the organization and operation of markets, and the economic analysis of government regulation. The last decade has provided a wealth of new, interesting, and important questions for industrial organization and regulatory economists to study. There have been substantial changes in market structure in many industries, from sources as varied as merger waves, reorganization of production and distribution, and increased international competition. Market-based institutions increasingly are replacing government regulation or ownership of firms, in industries as diverse as airlines, railroads, electricity, and telecommunications. Even where regulation has been retained, it often has been transformed to replace "command-and-control" with economic incentives and enhanced flexibility. Finally, researchers have developed a wealth of new databases and microeconometric techniques to study firm behavior, including issues such as pricing decisions in differentiated product markets, the effect of search costs on market outcomes, and the determinants of firms' contracting and internal organization decisions, that previously had been subject to only theoretical discussion.

This report describes several broad research themes analyzed by members of the Industrial Organization program. Rather than presenting an exhaustive summary of past research, I have chosen to focus on a set of major topics, and to explain critical findings in each one.

Deregulation, Restructuring, and Market Design: The Case of Electricity

In the late 1980s and the 1990s, throughout the world, basic infrastructure industries including electricity, telephone, natural gas, railroads, and even water distribution have undergone dramatic reorganizations. Government ownership or administrative regulation typically has been replaced with substantial reliance on private market mechanisms within much or all of the restructured industry, and "natural monopoly" characterizations have given way to notions of "workable competition." NBER researchers have been active in assessing the consequences of market restructuring and exploring market design issues in a variety of settings. I focus here on the work relating to electricity markets.

The electricity generation, transmission, and distribution industry, long operated as a vertically integrated, publicly-owned or regulated natural monopoly in virtually all markets worldwide, has attracted particular research attention. Catherine Wolfram has taken advantage of a wealth of data created by the United Kingdom's electricity restructuring to test competing models of firm behavior in deregulated markets.[1] She finds that while the two dominant generating firms in the England and Wales have been able to raise the pool price for wholesale electricity above their marginal costs of generation, they appear not to exploit their potential market power fully. Wolfram argues that this may be the result of efforts to reduce the threat of competitive entry or re-regulation. Frank Wolak and Robert Patrick provide further evidence on the potential magnitude of generators' market power in their study of the real-time price sensitivity of electricity demand for a group of industrial customers in the United Kingdom.[2]

A critical issue in the restructure of these markets is how specific institutions may enhance or mitigate the exercise of market power. England and Wales, which rely on an auction mechanism to clear the wholesale power market, provide an important research laboratory for exploring the effect of particular auction rules on market outcomes. Wolfram focuses on the multi-unit character of this auction to model generating firms' incentives to raise their bid price for a given unit, as a function of the total quantity of generation they bid into the pool.[3] Because the price of all electricity traded through the pool is set by the bid price for the last unit selected to run, a generator that thinks its unit may be marginal has an incentive to increase its bid. This raises the price received on that unit and all inframarginal units it owns. Wolfram's empirical analysis finds behavior consistent with these predictions.

Wolak and Patrick focus on the pool rules that determine capacity payments at peak demand periods.[4] As a result of these rules, generator revenues can include substantial payments intended to reflect the shadow cost of capacity needed for reliable operation of the system during these high demand hours. They also document the incentive that this gives firms to strategically manipulate the amount of generating capacity made available to the power pool during peak periods, and they provide econometric evidence that suggests this behavior is an important mechanism by which the two dominant generators raise their overall profitability.

These studies of the electricity market in England and Wales are important for the information they provide about that market in particular, but they also are of more general interest. Wolak's current research focuses on the broad lessons for market design in a comparative study of restructured electricity markets that includes Australia and New Zealand, a number of Latin American countries, Norway and Sweden, as well as England and Wales. This body of work illustrates how detailed institutional characteristics of a deregulated market may affect its performance.

This research also provides substantial guidance on issues facing policymakers involved in restructuring electricity and other markets across the United States and elsewhere. Within the United States electricity market, the restructuring movement is in its infancy but growing fast; California and a number of New England states are slated to move to a more decentralized, market-based pricing and allocation system in early 1998. Matthew White explores the political and economic determinants of the heterogeneity across states in the timing and intensity of these restructuring efforts.[5] A number of NBER researchers have been active in the design of restructured markets at the state level, and the execution of these varied reforms is likely to provide the data to fuel further research on the role of market institutions on firm behavior and market performance.

Pricing and the Exercise of Market Power

The relationship between firms' marginal costs of production and the prices they charge is a central question in industrial organization. A range of new databases and new research tools have permitted substantial advances in its analysis. One strand of this research uses data on the dynamic pattern of prices within markets to test models of oligopoly behavior. This research is of considerable interest within the I.O. community, as it informs us of the ability of firms to achieve more cooperative, and therefore more profitable, price outcomes. It also is relevant to researchers in macroeconomics, as it may have implications for the counter cyclical behavior of price-cost margins, an important component of some models of macroeconomic fluctuations.[6] Severin Borenstein, in work with Colin Cameron and Richard Gilbert, and with Andrea Shepard, explores these issues using data on retail gasoline markets over time.[7] His research suggests that gasoline retailers exercise at least short-run market power, and that price patterns over seasonal demand cycles are consistent with the predictions of Rotemberg-Saloner style supergame models of sustainable price collusion.[8]

Judith Chevalier and David Scharfstein develop a model in which liquidity constraints can generate countercyclical mark-ups. They find empirical support for its predictions in their study of supermarket pricing.[9] Fiona Scott Morton analyzes a particular event—passage of 1990 legislation establishing a "Most Favored Customer" clause for Medicaid pharmaceutical reimbursements—that may have provided firms with a mechanism for coordinating price increases.[10]

The public availability of detailed microdata on United States airlines, combined with the large number of geographic airline markets to study, has generated a wealth of empirical work on pricing behavior in this sector. NBER researchers have analyzed the determinants of market power; estimated structural models of demand, cost, and mark-ups; and studied the determinants of price dispersion, including the role of competitive price discrimination in generating the huge variation in prices paid by different passengers on the same airline and route that is observed in fare data.[11] My recent work with Borenstein explores the effect of bankruptcy on airline fares.[12] We conclude, in contrast to claims by some industry participants, that there is little evidence that bankrupt carriers harm their more healthy rivals. Indeed, while carriers may lower their prices prior to filing for Chapter 11 bankruptcy protection, their rivals appear to maintain their price level and maintain or increase their passenger volume.

A number of NBER researchers have turned to historical data to test models of firm behavior and to explore the mechanisms by which firms achieve collusive outcomes. Historical data may be more readily available than contemporaneous data, given firms' concerns about the sensitivity of price data and potential antitrust liability. It also may shed light on firm behavior under different antitrust regimes. Glenn Ellison, for example, has extended Robert Porter's classic analysis of price collusion by 19th century railroads to compare and test the formal predictions of competing supergame models of collusion.[13] Ellison suggests that price patterns in this market are characterized by periods of collusion punctuated by episodic price wars, and that these wars may be triggered by secret price cutting by some market participants.

David Genesove and Wallace Mullin study the exercise of market power in the sugar industry around the turn of the century.[14] Their work compares results from both traditional and "new empirical I.O." techniques for measuring the exercise of market power, explores the use and effectiveness of predatory pricing as an entry deterrent, and chronicles the development of the industry trade association as a device for coordinating pricing behavior. Scott Morton analyzes the determinants of predatory pricing responses to entry in British shipping cartels.[15]

Differentiated Products Markets

NBER researchers have made significant methodological advances in modeling price formation in differentiated product markets. This research involves the specification and estimation of "structural" models of firm behavior, linking models of cost and demand with specific parameterizations of firm behavior in equilibrium. Steven Berry, James Levinsohn, and Ariel Pakes develop and apply a set of these techniques to model the behavior of firms in the U.S. automobile industry.[16] In recent work, they estimate the distributional and welfare effects of the voluntary export restraints that were initiated in 1981 on Japanese cars sent to the United States. Their research suggests that this policy resulted in substantial transfers from U.S. consumers to U.S. auto producers, a relatively negligible effect on Japanese auto producer profits, and an overall U.S. welfare loss.

Timothy Bresnahan, Scott Stern, and Manuel Trajtenberg develop and estimate an alternative discrete choice model to analyze product differentiation and the sources of rents in the market for personal computers.[17] Their results, along with a substantial body of new research on differentiated products markets within the context of the market for new products, is reported in the NBER volume, *The Economics of New Goods,* edited by Bresnahan and Robert J. Gordon.[18]

Internal Organization of Firms

The questions of what a firm is, how its boundaries are determined, and how firms choose to organize their production, have attracted considerable attention from economic theorists in recent years. Despite this, empirical research lags far behind. This results, at least in part, from the difficulty of getting data on the internal choices and operations of firms. If the data problems can be solved, there are a host of exciting empirical research questions to be answered. NBER I.O. program members are beginning to make real inroads on a number of these.

Judith Chevalier and Glenn Ellison have used a novel database on mutual funds to explore a variety of issues that arise in a principal-agent setting.[19] Their studies on the behavior and performance of mutual fund managers, provide interesting insights on a number of agency questions. For example, they find that shareholder responses to variations in fund performance, combined with management contracts that base manager compensation on total fund assets, have strong incentive effects on managerial risktaking. Fund managers, moreover, respond to these incentives differently at year-end. Those who are "ahead" in September adopt more conservative investment strategies relative to those who are "behind." Those behind seem to take on greater risk in a gamble to "catch up" with the market. Chevalier and Ellison currently are extending this research to explore the role of career concerns in structuring incentives and determining fund manager behavior.

The decision of what activities to include within a firm's boundaries is fundamental but not well understood. The generally disappointing performance of diversified enterprises over the past 20 years has generated a substantial debate over the extent to which this reflects the difficulty of managing a diversified corporation well, or is a result of the actions of entrenched managers who pursue their own gain at the expense of shareholders' interests. Andrea Shepard and I use data on chief executive officers' (CEOs) compensation to analyze these competing claims.[20] We document a substantial pay premium for managers of diversified firms, but find that incumbent CEOs who diversify the firm earn less than their counterparts who maintain or increase the focus of the firm's activities. We argue that the data are more supportive of an ability-matching explanation for the pay premium than of managerial entrenchment models.

A number of I.O. program members also have explored the determinants of CEO compensation.[21] Paul Joskow, Shepard, and I argue that variations in executive pay across industries and over time suggest that political hostility to high CEO pay, mediated through regulatory institutions, may limit the compensation of executives in the most politically sensitive industries. Joskow, Wolfram, and I document a similar phenomenon within the electric utility industry. The incentive effects of compensation and the pay-for-performance relationship in executive pay also have attracted research attention.

Finally, a number of I.O. program members are involved actively in the NBER Project on Industrial Technology and Productivity, supported by the Sloan Foundation and described in the Spring 1996 *NBER Reporter*. This research combines traditional data sources with direct access to firms to understand how the organization of production lines, firm decisionmaking, or technology use may influence productivity and efficiency within the firm.

Vertical Organization of Firms

What determines the vertical structure of production: for example, are suppliers and manufacturers linked through common ownership, long-term contracts that may specify a variety of constraints on the parties' actions, or arms-length spot market transactions? The extent to which these choices are motivated by the quest for market power alone or reflect real efficiencies in production has important ramifications for theories of the firm as well as for the design and execution of antitrust policy. Theoretical work emphasizes that the balance between anticompetitive effects and efficiency may be context-specific. Douglas Bernheim and Michael Whinston, for example, explore this tension in a model of exclusive dealing contracts, in which a manufacturer prohibits retailers who carry its products from selling certain other specified products.[22]

Wallace and Joseph Mullin empirically investigate the tension between efficiency and market power motives in an analysis of the U.S. Steel long-term lease of iron ore properties of the Great Northern Railway in 1906.[23] While this lease often has been explained as vertical foreclosure of rival steel firms by U.S. Steel, their analysis suggests that the lease was expected to lower the market price for steel, and that the terms of the lease may be explained best as devices designed to achieve efficient relationship-specific investment.

Francine Lafontaine explores vertical relations in the context of business format franchising. She analyzes the variety of motives that may give rise to the development of franchising, and studies the way franchisors may act to solve a variety of principal-agent problems, through their choice of implicit and explicit contracts.[24] Her work on McDonald's with Patrick Kaufman, for example, suggests that franchisees earn substantial ex ante rents when they are awarded a franchise. While a variety of theories may explain the existence of ex post profits for franchisees, traditional models would not predict ex ante rents. Lafontaine argues that their presence may be explained by incentive models similar to "efficiency wage" type models, and by liquidity constraints among the potential franchisees most desired by McDonald's.

Auction Markets

Auctions, though typically thought of in conjunction with art and rare collectibles, are an important and common market form. Their use by governments has expanded substantially over the past few decades as auctions have been used to sell Treasury bills, to let procurement contracts, and to allocate property rights in areas as diverse as off-shore oil leases, timber, radio spectrum, and pollution. In the private sector, auctions have been used in markets ranging from real estate to wholesale fish and wholesale used car sales, and are the mechanism selected to set wholesale prices in many deregulated wholesale electricity markets as well. An extensive research program in economic theory has yielded important insights on the design, bidder behavior, and performance of auctions under certain stylized conditions. This research base played a critical role in the design of recent Federal Communications Commission auctions to allocate licenses for "PCS" spectrum. A growing empirical literature has been directed toward understanding the actual performance of different auction designs, the effect of bidder characteristics and auction structure on revenue, the possibility of bidder manipulation, and auction performance more generally.

A number of studies by I.O. program members have explored issues in auction performance, beyond the work described earlier on U.K. electricity auction markets. Robert Porter's research on auctions for off-shore oil and gas leases highlights the role of imperfect and incomplete information in government property auctions.[25] He analyzes firms' strategic responses to informational issues, including both pre-auction effects such as the formation of consortia and joint ventures, and post-auction effects, such as decisions of when and where to initiate exploratory drilling.

David Genesove analyzes the role of imperfect information and search costs on bidder behavior in wholesale markets for used cars.[26] Porter and Douglas Zona develop statistical tests and apply these to data on bids submitted in procurement contract auctions to detect possible bid-rigging by subsets of auction participants.[27] Finally, NBER researchers Paul Joskow and Dick Schmalensee, with Elizabeth Bailey, analyze the market for sulfur dioxide emission permits.[28] They conclude that while the Environmental Protection Agency's auction market is subject to a number of design flaws, the private market rapidly developed an apparently efficient alternative trading mechanism that has rendered these flaws largely irrelevant.

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Research Summaries

The Evolution of Retirement

Dora L. Costa*

Not only are more men living past age 65 in America today than ever before, but American men also have been abandoning the labor force at ever younger ages. The retirement rate of American men over the age of 64 has risen rapidly from a mere 25 percent at the end of the last century to over 80 percent today. At the same time the very nature of retirement has changed. For most individuals retirement is no longer a time of withdrawal from all activities and of dependence on family and friends; rather it is a time of discovery, personal fulfillment, and relative independence. In the past, such a retirement experience was limited to the wealthy few who could afford it. Now it is an option available to the majority of workers.

That most men now can look forward to a period of personal fulfillment at the end of their working lives is one of the achievements of our century, but such a retirement is expensive, and financing it poses budgetary dilemmas. Approximately 80 percent of elderly households receive over half of their income from Social Security, and Social Security is facing a fiscal crisis. If men continue to abandon the labor force at ever younger ages, the crisis is likely to be even more acute. To understand whether retirement rates will continue to rise, we must examine how retirement has evolved from 1880 to the present. Retirement rates were rising throughout this period. In fact, 41 percent of the long-run rise in retirement rates occurred before the postwar growth of Social Security and private pension plans. In my forthcoming book, *The Evolution of Retirement: An American Economic History, 1880–1990* (University of Chicago Press for NBER, 1998), I therefore investigate the factors that have fostered rising retirement rates.[1]

Costa is an NBER faculty research fellow and an associate professor of economics at MIT. Her profile appears in this issue.

Income and Retirement

Retirement requires income, whether in the form of state-provided retirement or disability benefits, private pensions, income from other family members, or assets. Researchers have investigated the role that each of these income sources plays in the retirement decision, largely using cross-sectional data for the years after the 1960s. But, because 70 percent of the rise in retirement among men older than 64 occurred before 1960, only large increases in benefits could have enticed those remaining in the labor force to have withdrawn.

Previous researchers have not been able to examine the impact of income on the retirement decision prior to the 1960s because the necessary data has been unavailable. Fortunately, a longitudinal dataset that follows Union Army recruits of the American Civil War from their youth to their death can be generated from census records and from records of the Union Army pension program. At the beginning of the century, Union Army pensions were the most widespread form of assistance to the elderly, serving about a quarter of the population over age 64 in 1900. I estimate the income effect of Union Army pensions on retirement rates.

I find that pensions had a substantial impact on retirement rates both in 1900 and in 1910. My findings suggest that the high labor force participation rates of older men prevailing at the turn of the century arose because retirement incomes were too low to fully support them and, as retirement incomes have risen, so have retirement rates. I attribute much of the long-term increase in retirement rates to the rising incomes of the elderly. Their wages, and hence their savings and pensions, have increased, as have government transfers.

However, increased income is not the sole explanation for the rise in retirement. In fact, I show that the income elasticity of retirement has fallen over time. Whereas rising retirement incomes could explain up to

90 percent of the increase in retirement rates between 1900 and 1930, they could account for only half of the increase between 1930 and 1950, and for almost none of the more recent increase. Workers now may be less responsive to changes in transfer income because they are no longer close to subsistence levels; instead, they reach retirement age with enough to satisfy their consumption needs. Alternatively, by establishing age 65, and later age 62, as an "official" retirement age, Social Security may have led individuals to want to retire at that age and therefore reduced the effect of income on the work decision. Finally, retirement also has become more attractive because men are less circumscribed in their choice of leisure time activities. Mass tourism and mass entertainment have increased the variety of recreational activities and lowered their price.

Other Explanations

I consider several other explanations for increased retirement rates, including worsening average health of the population. I show that retirement rates rose despite declines in the burden of chronic disease. Between 1910 and 1983, the prevalence of heart disease among men above the age of 64 fell from 75 to 40 percent; that of musculoskeletal disease from 68 to 48 percent; and that of respiratory disease from 42 to 30 percent. Between 1935 and 1992, rates of blindness fell by about one third. The elderly have benefitted from advances in medical technology, fewer occupational hazards, and better conditions in early life. At the same time, health has become less important to the retirement decision. Because we now can better control chronic conditions, and because physical job requirements have been reduced, those in poor health are more likely to participate in the labor force relative to those in good health than was the case in 1900 and in 1910. Age 65 therefore may no longer be as appropriate a demarcation of old age as it was in the first half of the century, when the typical health of a 65-year-old was very poor.

Declines in part-time work, nonfarm self-employment, and farming do explain the rise of retirement since 1880 either. The proportion of 65-to-74-year-old employees who work part-time has risen from 15 percent in 1940 to 47 percent in 1990. The fraction of the labor force that is self-employed has fallen, but only since the 1960s have older self-employed workers been more likely to remain in the labor force than wage and salary workers. The lower retirement rates of farmers relative to non-farmers are also a recent phenomenon. Using longitudinal data on Union Army veterans, I show that in 1900 and 1910 farmers were no less likely to retire than non-farmers and that, upon retirement, farmers moved to a nearby town.

One factor that accounts for up to one-fifth of the increase in retirement rates of men over age 64 since 1900 is the increased duration of unemployment spells. Unemployment within state of residence had a substantial effect on the retirement of men over age 64 in 1900, and on men aged 50 to 64 in 1980. But, the unemployed would not have been able to retire unless they had income sources other than wages. In fact, high unemployment within state of residence was much more likely to induce Union Army veterans versus non-veterans to leave the labor force.

The Retirement Lifestyle

A man who retired in 1880 could expect a very different life from that of a man retiring today. Close to half of retired men in 1880 were living in the households of their children or other relatives, whereas today that figure is only 5 percent. By examining data on the living arrangements of Union Army veterans, I show that, at the beginning of the century, men would have preferred to remain independent of their families. The majority simply could not afford to do so, though. I argue that rising retirement incomes explain the decline in the percentage of men older than 64 living in the households of their children and the narrowing of differences in living arrangements by retirement status since the beginning of the century. But, I also show that changes in income now have a relatively smaller effect on the living arrangements decision than they did in 1910, perhaps because independent living is now relatively inexpensive. The growth of retirement communities in low cost living areas, the declining price of transport and of communication with family members, and the rise in private and state social support services, among other factors, have lowered the price of living alone.

Independent living may be not only cheaper than it was in the past but also more attractive. A leisurely retirement lifestyle is now often made possible by resettlement to a community with a better climate or other environmental amenities, or to one with a low cost of living. As independent living has become more attractive, this in turn may have increased the attractiveness of retirement.

The typical worker now looks forward to retirement (or at least the first few years of it), because retirement has become a time for travel and recreation. Leisure time activities are now pursued more widely across all income classes because of rising incomes and because technological change has not only lowered the price of existing products, but also has created new products that lower the "quality-adjusted price" of entertainment. Technological advances also have lowered travel time and thereby decreased the time-cost of entertainment. Using consumer expenditure surveys, I show that because recreational goods and leisure are complements, the lower price of recreation (in both time and money) may have increased the demand for retirement.

The elderly in part have financed their retirement through public monies. First it was through Union Army pensions, then in the late 1920s and early 1930s many states provided pensions to the needy aged. These pensions later were replaced by Social Security Old Age Assistance and Old Age Insurance. The growth of all of these programs was made possible by the availability of revenue resources and was spurred in part by increasingly well-organized elderly pressure groups. As the population ages, the elderly may become an even more powerful political force. But, as their numbers rise, it will become increasingly difficult for the young to finance a lengthy retirement for the old. The continued provision of the retirement lifestyle to which we have grown accustomed is increasingly likely to lie with individuals.

[1] *See also "Pensions and Retirement: Evidence from Union Army Veterans,"* Quarterly Journal of Economics *(May 1995); "Agricultural Decline and the Secular Trend in Retirement Rates,"* Explorations in Economic History *(October 1995); "Health and Labor Force Participation of Older Men, 1900–1991,"* Journal of Economic History *(March 1996); "A Theory of Technophysio Evolution, With Some Implications for Forecasting Population, Health Care Costs, and Pension Costs,"* Demography *(February 1997); and "Displacing the Family: Union Army Pensions and Elderly Living Arrangements,"* Journal of Political Economy, *forthcoming December 1997.*

Pricing, Monetary Policy, and Aggregate Fluctuations

Julio J. Rotemberg*

My Ph.D. thesis considered the extent to which firms' reluctance to change their posted prices contributes to business fluctuations and, in particular, makes monetary policy powerful in influencing aggregate output. Ever since, much of my research has been concerned both with the role of monetary policy and with the connection between pricesetting by firms and the evolution of GNP.[1] This article summarizes that research.

Price Rigidity and Monetary Policy

In some ways, the hypothesis that firms are reluctant to change their prices plays the same role as the hypothesis of wage rigidity in traditional Keynesian models. Both imply that expansionary fiscal or monetary policies raise GNP. The difference is that with wage rigidity, firms are only willing to raise their output if their marginal cost of production falls as a result of a decline in real wages. By contrast, firms that were not willing to raise prices will increase their output in response to expansionary monetary and fiscal policies even if doing so raises their marginal cost of production. Thus, the existence of price rigidity can rationalize the observation that real wages tend to increase (albeit slightly) when real GDP rises.[2]

In my early work, I also show that this hypothesis is broadly consistent with the relationship between monetary aggregates and GDP.[3] Another way to gauge whether price rigidity explains the effects of monetary policy is to use the recent explosion of research on how the Federal Reserve System conducts monetary policy.[4] This research allows one to identify monetary policy disturbances through movements in interest rates that are different from those that would represent the "usual" reaction of the Fed to economic circumstances. A good way of ascertaining the empirical relevance of the theory is thus to analyze whether it correctly predicts the way the economy reacts to these monetary disturbances.

It turns out that the theory is remarkably successful in this regard.[5] Because there are good reasons to believe that exchange rate movements are linked to price movements, Alberto Giovannini and I analyzed whether a model of this type could help us to interpret the empirical movements in the dollar/deutschemark exchange rate. While the enormous volatility of exchange rates makes it difficult to explain more than a small fraction of their movements, we find some empirical corroboration for the model in these data.[6] There are thus a number of dimensions in which the hypothesis of price rigidity helps to explain aggregate output fluctuations.[7]

More recently, I have returned to the sort of model I considered in my early work. This was prompted by some research that Michael Woodford and I did on the characteristics of business cycles.[8] We discovered that various definitions of the United States business cycle, including the one that is implicit in the NBER chronology of business cycle peaks and troughs, have a very simple statistical property. Periods in which the economy is in a recession, and troughs

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in particular, turn out to coincide with periods in which the current level of output is significantly below the level that it can be expected to reach within the next two years. In other words, troughs have the property that simple statistical models predict a high growth rate of output from this point onwards. This accords with common sense and with the way that newspapers talk about recessions since, after all, their discussion of recessions often refers to the expectation of a recovery.

There is also a conceptual advantage in measuring the business cycle by using the expected change in output as opposed to more traditional measures, including the unemployment rate. The unemployment rate, in particular, is also subject to noncyclical changes which can be attributed, for example, to changes in the composition of the labor force. Similarly, traditional measures of detrended GNP tend to perform poorly as cyclical measures when technological changes exist which lead to permanent changes in GNP.

Some of my recent work has been devoted to understanding whether this measure of cyclically adjusted output is connected to inflation as predicted by models of price rigidity and, in particular, by the model I originally developed in my thesis.[9] The basic macroeconomic idea behind models of price rigidity is that increases in the money supply raise the demand for output but lead, initially, to only a muted response of prices. This means that output rises temporarily and, as a result, output should be expected to rise less in the future. On the other hand, the muted contemporaneous response of prices implies that prices should be expected to rise substantially. Thus periods in which prices are expected to rise a lot should coincide with periods where output is expected to rise relatively little. Indeed, I find a very strong negative correlation between expected changes in output over the next few years and expected changes in prices over the same time period. This is, in effect, an updated version of the negative correlation between inflation and unemployment that is known as the Phillips curve. However, unlike the Phillips curve, and consistent with the sort of theoretical models I have been interested in, this relationship does not fall apart when applied to empirical data from the 1970s.

My most recent work with Woodford explores the implications of this type of model for the conduct of optimal monetary policy.[10] In other words, we investigate how the Federal Reserve System should let the federal funds rate react to the shocks that impinge on the U.S. economy. We show that, at least in some respects, it is ideal to set interest rates so that inflation is stabilized completely. This reduces the economic effect of price rigidity, both by ensuring that aggregate output is as close as possible to the level it would have reached if prices were flexible and by making relative prices independent of the shocks that impinge on the economy. The problem is that stabilizing the rate of inflation requires that interest rates rise a great deal every time a shock tends to increase inflation. This requires that interest rates be quite volatile. Aside from any other disadvantages of interest volatility, such a policy is only feasible if average inflation and average interest rates are high. Otherwise it would be impossible to maintain positive interest rates in the aftermath of a shock that requires a large reduction in interest rates. Thus we show that complete stabilization of inflation is undesirable. On the other hand, it is possible to set interest rates in such a way that inflation is much more stable than it has been historically while, at the same time, keeping average inflation below 3 percent per year.

Pricing and Macroeconomics More Generally

At least some of the power of price rigidity as an explanation of aggregate fluctuations stems from its ability to explain why firms raise their output in periods where their marginal costs increase. This seems to be a quite robust feature of the increases in output that take place in economic booms. Recently, this has been documented in a series of important papers by Mark Bils,[11] although the fact appears to be have been known for some time: Wesley Mitchell wrote in 1941 that, in business expansions "equipment of less than standard efficiency is brought back into use; the price of labor rises while its efficiency falls; the cost of materials, supplies and wares for resale advances faster than selling prices; discount rates go up at an especially rapid pace, and all the little wastes incidental to the conduct of business enterprises grow steadily larger."[12]

If marginal costs in terms of some price index rise for all firms in booms —that is, if real marginal costs rise— it must be that the ratio of price to marginal cost is falling for the typical firm. In other words, firms are experiencing reductions in the markup of price over marginal cost.[13]

Aside from price rigidity, there can be other reasons for such a change in markups, and I have devoted some effort to understanding these alternate mechanisms. In particular, this motivates my work with Garth Saloner on the behavior of prices in oligopolistic markets. We consider oligopolistic markets in which firms keep their prices high as a result of an implicit understanding. The understanding is that any firm which cuts its current prices triggers a future period of retaliation where all firms cut their own prices. The result of this understanding is that prices do not rise very much (and might even fall) in response to increases in demand. To see this, consider an industry whose demand increases temporarily. This increase in demand raises current profitability and, if prices in the industry do not change, it also raises the benefits to be had from undercutting the industry price. Because the increase in demand is temporary, the losses from the subsequent retaliation do not grow as much as the profitability of undercutting the current price. Of course, increasing the industry price in response to an increase in demand serves only to raise the relative benefits of undercutting the industry price even more. To stop firms from undercutting the industry price when demand rises, it thus may be necessary to lower the price charged by the entire industry.

Woodford and I show that implicit collusion in oligopolistic industries can explain not only the qualitative but also the quantitative response of the U.S. economy to changes in military purchases.[14] We focus on military purchases because the Korean War, the Vietnam War, and the Reagan buildup have been associated with some of the most dramatic changes in the U.S. fiscal position. As might be expected, these increased purchases are associated with increases in economic activity. What is more novel is that we show that they are associated with increases in the purchasing power of wages. This is inconsistent with the traditional explanations for government-purchases-led expansions and is consistent with the view that, fearful of breakdowns in the collusive understanding, oligopolistic industries allow their prices to fall relative to their marginal cost of production.

This logic of implicit collusion also suggests that firms would raise their prices disproportionately when there are temporary increases in their costs. Such an increase in costs makes firms much less keen on undercutting the industry price. We use this idea to explain why oil price increases lead to such severe economic contractions.[15] Price rigidity, on its own, would tend to predict that the response of the economy to an oil price increase is quite muted, since firms would fail to pass along the increase in their input costs to the buyers of their final output.[16] Thus, implicit collusion, or some other departure from standard models of pricing, seems important for understanding the effects of these cost shifts. Of course, much research is still needed to understand the exact combination of departures from marginal cost pricing that best explains economic fluctuations.

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[1] *An extensive discussion of the connection between pricing and macroeconomics is contained in J. J. Rotemberg and M. Woodford "The Cyclical Behavior of Prices and Costs" in J. Taylor and M. Woodford,* Handbook of Macroeconomics, *forthcoming.*

[2] *J. J. Rotemberg, "Monopolistic Price Adjustment and Aggregate Output,"* Review of Economic Studies *49, (October 1982), pp. 517–531.*

[3] *J. J. Rotemberg "Sticky Prices in the United States,"* Journal of Political Economy *90, No. 6, (December 1982), pp. 1187–1211.*

[4] *For leading examples, see B. S. Bernanke and A. S. Blinder "The Federal Funds Rate and the Channels of Monetary Policy,"* American Economic Review, *82, 4, (1992) pp. 901–921, and J. B. Taylor "Discretion Versus Policy Rules in Practice," Carnegie-Rochester Conference Series on Public Policy 39, (1993), pp. 195–214.*

[5] *J. J. Rotemberg and M. Woodford, "An Optimizing Econometric Framework for the Evaluation of Monetary Policy,"* NBER Macroeconomics Annual *forthcoming.*

[6] *A. Giovannini and J. J. Rotemberg "Exchange Rate Dynamics with Sticky Prices: The Deutsche Mark, 1974–1982,"* Journal of Business Economics and Statistics *7, No. 2, (April 1989), pp. 169–78.*

[7] *For a survey that discusses additional issues surrounding price rigidity see J. J. Rotemberg "The New Keynesian Microfoundations,"* NBER Macroeconomics Annual, *(1987), pp. 69–104.*

[8] *J. J. Rotemberg and M. Woodford "Real Business Cycle Models and the Forecastable Movements in Output, Hours and Consumption,"* American Economic Review, *86, (March 1996), pp 71–89.*

[9] *J. J. Rotemberg "Prices, Output and Hours: An Empirical Analysis Using a Sticky Price Model,"* Journal of Monetary Economics, *37, (June 1996), pp. 505–34.*

[10] *J. J. Rotemberg and M. Woodford, "An Optimizing Econometric Framework for the Evaluation of Monetary Policy,"* NBER Macroeconomics Annual *forthcoming..*

[11] *M. Bils "The Cyclical Behavior of Marginal Cost and Price,"* American Economic Review, *77, (December 1987), pp. 838–57 and M. Bils and J. A. Kahn, "What Inventory Behavior Tells us about Business Cycles," Rochester Center for Economic Research Working Paper 428, September 1996.*

[12] *W. C. Mitchell,* Business Cycles and their Causes, *Berkeley: University of California Press, 1941.*

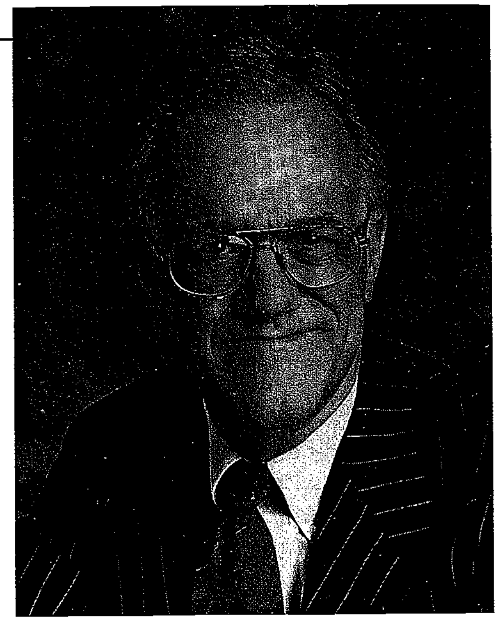
[13] *See J. J. Rotemberg and M. Woodford "Markups and the Business Cycle,"* NBER Macroeconomics Annual, *(1991), pp. 63–129 as well as* Handbook for Economics, *forthcoming, for further evidence of this.*

[14] *J. J. Rotemberg and M. Woodford, "Oligopolistic Pricing and the Effects of Aggregate Demand on Economic Activity,"* Journal of Political Economy, *100, (December 1992), pp. 1153–1207.*

[15] *J. J. Rotemberg and M. Woodford "Imperfect Competition and the Effects of Energy Price Increases Economic Activity,"* Journal of Money, Credit and Banking, *28, (November 1996), pp. 549–77.*

[16] *J. J. Rotemberg "Supply Shocks, Sticky Prices and Monetary Policy,"* Journal of Money, Credit and Banking, *Vol. 15, No. 4, (November 1983), pp. 433–5.*

NBER Profile: *John Herron Biggs*



John H. Biggs has been chairman of the NBER's Board of Directors since 1996 and a member of the Board since 1987. He is also Chairman and Chief Executive Officer of TIAA-CREF. Prior to his election to that position in January 1993, Biggs had served as President and Chief Operating Officer of TIAA-CREF since February 1989. He also has served as a CREF Trustee since 1983.

A native of St. Louis, Biggs earned an A.B. degree in classics from Harvard University and a Ph.D. in economics from Washington University in St. Louis. He began his professional career with the General American Life Insurance Company in 1958, serving in various actuarial management positions for the company until he was appointed Vice President and Controller in 1970. In 1977, Biggs became Vice Chancellor for Administration and Finance at Washington University in St. Louis. He was named President and CEO of Centerre Trust Company, St. Louis, in 1985.

Biggs's wife, Penelope Parkman Biggs, has taught Latin at a small private school in St. Louis. Their son, Henry, is a college professor and the father of two. In his leisure time, Biggs plays golf, squash, and tennis. He and his wife also enjoy the ballet, opera, and the theater.

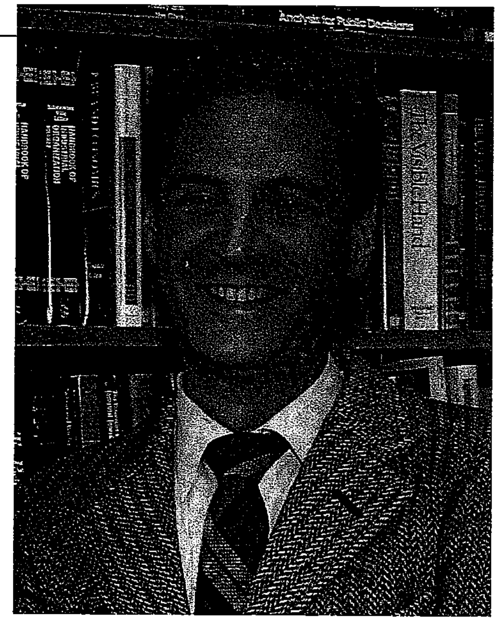
NBER Profile: *Dora L. Costa*

Dora L. Costa is a faculty research fellow in the NBER's programs on the Development of the American Economy and on Aging. She is also the Ford Career Development Associate Professor of Economics at MIT where she teaches economic history and econometrics. Costa received her B.A. in economics and mathematics from the University of California, Berkeley in 1986 and her Ph.D. in economics from the University of Chicago in 1993. She spent 1995–6 at the NBER as an Aging Fellow.

Costa's research focuses primarily on issues in labor economics, demography, and health, as interpreted over the long span of American economic history. Her work has covered a wide range of topics including: retirement; elderly living arrangements; determinants of older age mortality and morbidity; long-term trends in the health of the population; and trends in the consumption of recreational goods. She is the author of numerous articles and a forthcoming book, *The Evolution of Retirement: An American Economic History 1880–1990* (University of Chicago Press for NBER, 1998).

Costa enjoys food, frisbee, National Parks, and weekends at the office. She and Matthew Kahn, an economist at Columbia, will marry at the end of May.

NBER Profile: *Adam B. Jaffe*



Adam B. Jaffe is Coordinator of the Project on Industrial Technology and Productivity of the National Bureau of Economic Research (NBER) and Associate Professor of Economics at Brandeis University. He is also principal investigator for a National Science Foundation research project, funded through the NBER, to compile a comprehensive database on patents and patent citations and to use these data to document the flows of technological knowledge across time, industries, and geographic areas. Jaffe's areas of specialization are the economics of technological change and the economics of regulated industries. He has been a Faculty Research Fellow and a Research Associate of the NBER since 1985.

Jaffe is on leave from Brandeis this year, and is working in the NBER's Cambridge office. Previously, he was Assistant and then Associate Professor of Economics at Harvard University. During 1992–4 he visited the John F. Kennedy School of Government at Harvard. During academic year 1990–1, Prof. Jaffe took leave from Harvard to serve as Senior Staff Economist at the President's Council of Economic Advisers in Washington, where he had primary staff responsibility for energy policy, technology policy, and regulatory policy. Jaffe received his S.B. in Chemistry (1976) and his S.M. in Technology and Policy (1978) from MIT, and his Ph.D. in Economics from Harvard University (1985).

Jaffe is a member of the Board of Editors of the *American Economic Review* and an Associate Editor of the *Journal of Industrial Economics;* Co-organizer of the NBER Science and Technology Policy Research Workshop; and a member of the Economics Roundtable, The Advanced Technology Program, National Institute of Standards and Technology, U.S. Department of Commerce.

He is married to Pam Jorgensen. They and their children, Sonia and Michael, live in Brookline. Jaffe likes to watch birds and to sing renaissance music.

Conferences

The Economics of Aging

The NBER and the Japan Center for Economic Research (JCER) jointly sponsored a conference on "The Economics of Aging" in Kyoto on May 8 and 9. The papers and discussions from the conference will be published by the University of Chicago Press; the availability of the volume will be announced in a future issue of the NBER *Reporter*.

The agenda for the two-day conference was:

Toshiaki Tachibanaki, Kyoto University, and **Tetsya Maruyama**, University of Pennsylvania, "Promotion, Incentives, and Wages"
Discussant: David M. Cutler, NBER and Harvard University

Richard G. Woodbury, NBER, "The Motivations for Business Retirement Policies"
Discussant: Toshiaki Tachibanaki

Yukiko Abe, Nagoya City University, "Labor Supply of the Japanese Elderly in the 1980s to 1990s and the Employees' Pension Benefits"
Discussant: David A. Wise, NBER and Harvard University

James M. Poterba, NBER and MIT, and **Andrew A. Samwick**, NBER and Dartmouth College, "Household Portfolio Allocation over the Life Cycle"
Discussant: Makoto Saito, Kyoto University

Seki Asano, Tokyo Metropolitan University, "Japanese Public Pension System and the Demand for Private Annuity and Life Insurance"
Discussant: Andrew A. Samwick

Steven J. Venti, NBER and Dartmouth College, and **David A. Wise**, "Choice, Chance, and Wealth at Retirement"
Discussant: Naoyuki Yoshino

Makoto Saito, "Empirical Investigation of Intergenerational Consumption Distribution: A Comparison among Japan, the U.S., and the U.K."
Discussant: Steven J. Venti

Matthew J. Eichner, MIT, "Choice Among Employer-Provided Insurance Plans: Preliminary Evidence"
Discussant: Yukiko Abe

David M. Cutler, "International Variation in Health Care Policies and the Issues Motivating Policy Reform"
Discussant: Makoto Kawamura, Hosei University

Reiko Suzuki, JCER, and **Seiritsu Ogura**, Hosei University, "Distribution of the Cost of Health Care for the Aged in Japan"
Discussant: Matthew J. Eichner

Satoshi Nakanishi and **Noriyoshi Nakayama**, University of Marketing and Distribution Science, "The Effects of Demographic Changes on Economic Variables: A Simulation Analysis"
Discussant: David M. Cutler

Seiritsu Ogura, Hosei University, "What Went Wrong with the Official 1992 Japanese Population Projection?"
Discussant: Richard G. Woodbury

Tachibanaki and **Maruyama** analyze firm data from Japan and investigate the relationship among promotion, incentives, and wages. Given the aging trend in Japanese firms, there is a desire to reduce long-run labor costs. The authors investigate whether Japanese firms induce the highest work-effort from their employees under existing industrial relations systems. They conclude that employees in lower positions are motivated well by the existing Japanese promotion and wage system, while those in higher positions are unaffected by the system.

Most traditional defined benefit pension plans in the United States encourage older workers to retire. For long-service employees, the financial incentive to retire often begins as young as age 55. By age 65, essentially all pension plans encourage retirement. **Woodbury** explores the motivations guiding the design of business retirement policies and, in particular, whether these incentives were implemented deliberately to induce retirement at these ages. His analysis is based on historical business documents relating to pension design, and on interviews with executives at 20 large U.S. corporations. He finds that in most cases, retirement incentives are either unintentional or secondary to the policy's central motivation. The primary policy motivations relate to competitiveness (providing benefits that are similar in structure and value to those at competing employers) and to assuring the financial well-being of retirees. At most companies, the initial design and ongoing evaluation of the pension plans is based on comparative analyses among similar employers, and on the effectiveness of policy provisions in achieving income replacement objectives.

Abe studies the labor supply of 60–64 year-old Japanese males who are covered by Employees' Pension Insurance (EP). The EP benefits are reduced for working beneficiaries, who are eligible to receive benefits and work. In evaluating the effects of such benefit reduction schemes, Abe incorporates the choice of "work mode" into his analysis. The EP benefit reduction may not apply to those who are self-employed, work in the public sector, or work part-time: about 30 percent of working EP-eligibles. After addressing this issue and controlling for year, age group, EP status, and other personal characteristics, Abe estimates that benefit reduction does discourage labor supply by 60–64 year-old males who are EP-eligible. Further, he finds, the labor force participation rate and the proportion of private sector employees among 60–64 year-old EP-eligibles seems to have increased between 1983 and 1988, and has stayed more or less constant between 1988 and 1992.

Poterba and **Samwick** analyze the allocation of household financial portfolios in the United States. They distinguish between age and cohort effects using data from the Federal Reserve Board's Survey of Consumer Finances. They show that cohort effects have an important effect on the estimated age profiles for the ownership and portfolio shares of both financial and nonfinancial wealth. Age profiles vary considerably across different assets, and for a given asset, across cohorts. They discuss the implications of their results for the application of the life cycle model to the components of wealth, for the prospective retirement income security of the baby boom generation, and for the effects of taxation on asset allocation.

Asano examines the effects of public pension benefits on individual Japanese households' choices of life insurance and private annuities. He uses two waves of micro data obtained in 1990 and 1994, which provide a unique opportunity to observe the effects on households' asset allocation of declining social security benefits, changes in total asset value, and changes in expectations. He finds that the intended level of total annuities was raised on average by about 4 million yen from 1990 to 1994, which more than compensated for reduction of public pension benefits. Also, compared to 1990, the age profile of mean total annuities became flatter in 1994 across all age groups: younger generations began to accumulate personal annuities. The age profile of mean total life insurance stayed quite flat and stable in both periods, but intragenerational variations widened up to twice the level of 1990.

Venti and **Wise** show that at all levels of *lifetime* earnings, there is enormous dispersion in the accumulated wealth of families approaching retirement. Some households with low incomes, and a significant proportion of high income households, save little. A substantial proportion of low income households save a great deal, though. Very little of this dispersion can be explained by chance differences in individual circumstances—"largely outside the control of individuals"—that might limit the resources from which saving plausibly might be made, Venti and Wise write. They also find that investment choice is not a major determinant of the dispersion in asset accumulation. It matters about as much as chance events that limit the available resources of households with the same lifetime earnings. They conclude that the bulk of the dispersion must be attributed to differences in the amount that households choose to save. The differences in saving choices among households with similar lifetime earnings lead to vastly different levels of asset accumulation by the time retirement age approaches.

Saito examines how the consumption goods generated by economic growth have been distributed among generations during the past 30 years in Japan, the United States, and the United Kingdom. He finds that fewer of the fruits of growth are distributed to younger generations, per capita, in Japan and the United States, while younger generations get a larger share in the United Kingdom. Particularly in the United States, the share of the generated resources distributed to the current young generation has deteriorated dramatically. This suggests that without sound economic growth, the living standard of future generations might not be sustained under the existing intergenerational transfer scheme in the United States.

Eichner presents some basic evidence on how employees choose health insurance coverage from a menu of options. He also studies employees who elect to change plans voluntarily. This group consists disproportionately of larger family groups tending to move between two of the more generous coverage options. Movement between plans seems to be associated with higher expenditures both before and after the move, Eichner finds.

Cutler argues that medical systems in the developed world are likely to embark on a "third wave" of health care reform over the next several years. The first wave of reform was the guarantee of universal coverage and the establishment of a very generous insurance package. This was accomplished from the early post-World War II period through 1980. The second wave of reform, beginning in the early 1980s, was the era of overall spending limits. This period was marked by an emphasis on limiting the overall costs of medical care, through global budgets on hospital revenues and fee restrictions on providers. Over time, however, systems with these constraints have fallen, and the inefficiencies associated with overall constraints have become more noticeable. This suggests that a third wave of reform is like to arise, concentrating on microeconomic efficiency and increased use of markets to allocate medical services and health insurance.

Suzuki and **Ogura** investigate the geographic differences in per capita health care costs for the elderly. They find that the differences are more extreme between municipalities than between prefectures, and that controlling the supply of health care does not seem to close these gaps. One reason for this phenomenon is that the elderly in lower income municipalities seem to have longer hospital stays. Furthermore, the smaller the population, the greater the variation in health care costs. These findings cast serious doubt on the qualification of municipalities which are required to act as insurers for most of the elderly under the current Japanese public health insurance system. Suzuki and Ogura also compare individual health care costs of the elderly over a two-year period in several prefectures in Japan. For outpatient care, the bottom 80 percent of the population consumes about half of total health care, and the top 10 percent consumes more than 30 percent of total health care. Furthermore, these intensive consumers of health care tend to be persistent, and Suzuki and Ogura discuss the economic implications of separating them from the rest of the elderly population.

Nakayama and **Nakanishi** analyze the effect of demographic changes and health policy on the health care sector and the economy as a whole. Keeping the present health system, the demand for medical care will be 2.7 times larger in 2010 and 3.2 times larger in 2030 than the demand for medical care in 1990. The forecast of the growth rate of medical care demand is 2.7 percent per annum during the authors' simulation period. Although people will spend more for medical care than at present, the aging of the population will depress their health status. The share of medical expenditures in the whole economy (that is, in GDP) will grow to 11.3 percent, then gradually decline after 2015.

Every five years, the Japanese government publishes an official population projection. The last two official projections predicted a recovery of the Total Fertility Rate (TFR) to 2.0 and 1.8 respectively by the year 2020. The latest projection, published last January, predicted a more modest recovery of 1.6. **Ogura** examines the birth rate population model of the 1992/3 projection, and finds two fundamental problems. First, the model is seriously misspecified and estimation results using the truncated data tend to be very unstable. Second, the projection assumes that structural adjustments are completed by the 1960 cohort. In fact, Ogura estimates that there was a drop of almost 0.3 in TFR between the 1960 and 1964 cohorts. Most likely, the long-run equilibrium TFR at this moment is around 1.4, or the current TFR level. Government claims for future recovery in TFR therefore should not be taken seriously.

International Seminar on International Trade

The biennial joint NBER-CEPR (Centre for Economic Policy Research in London) International Seminar on International Trade (ISIT) was held near Paris on May 23–5. As part of ISIT's objective of promoting research in North America and Europe on new trade and trade-related topics, this year's conference, which was organized by Robert Baldwin, NBER and the University of Wisconsin, Madison, Richard Baldwin, NBER and CEPR, Graduate Institute of International Studies, Geneva, and Jaques Thisse, CEPR and CORE at Universite Catholique de Louvain, was devoted to the "new" economic geography field. Papers from the conference will be published as a special issue of the *European Economic Review*. The following papers were presented:

Luca Ricci, International Monetary Fund, "Geography and Comparative Advantage"

Donald Davis, NBER and Harvard University, and **Davis Weinstein**, University of Michigan, "Economic Geography and Regional Production Structure: An Empirical Investigation"

Philippe Martin and **Gianmarco Ottaviano**, CEPR, "Growing Locations: Industry Location in Models of Endogenous Growth"

Paul R. Krugman, NBER and MIT, "The Rise, Decline, and Return of Geographical Concentration"

James Markusen, NBER, and **Anthony Venables**, CEPR, "The Impact of Foreign Direct Investment on Host Economies"

Richard Baldwin, CEPR, "Economic Agglomeration and Footloose Capital"

(Continued on next page)

Diego Puga, London School of Economics, "The Rise and Fall of Regional Inequalities"

Mark Beardsell, Brown University and **Vernon Henderson**, NBER and Brown University, "High Tech Spatial Evolution"

Konrad Stahl, CEPR, and **Uwe Walz**, University of Bochum, "Firm Heterogeneity an Local Labor Markets"

Gilles Duranton, London School of Economics, "Decentralization, Representative Democracy, and Efficiency"

Riccardo Faini, CEPR, "Skilled Labor, Migration, and Regional Growth"

Pierre-Philippe Combes, CREST-INSEE, "Economic Structure and Local Growth: An Econometric Study on France, 1984–93"

Ricci investigates the relationship between agglomeration of economic activity and the pattern of specialization of countries, as well as the role of comparative advantage versus average productivity. He develops a two-country, three-sector model which includes increasing returns to scale, product differentiation, monopolistic competition, and trade costs. He finds that comparative advantage determines specialization, while competitive advantage (that is, the average efficiency of one location) drives agglomeration. Once endogenous agglomeration effects are taken into account however, an increase in comparative advantage is not necessarily associated with an increase in specialization. Agglomeration in one country reduces its specialization within an increasing-returns-to-scale industry.

There are two principal theories of why countries or regions trade: comparative advantage and increasing returns to scale. Yet there is virtually no empirical work that assesses the relative importance of these two theories in accounting for production structure and trade. **Davis** and **Weinstein** find support for the existence of economic geography effects in eight of 19 Japanese manufacturing sectors, including transportation equipment, iron and steel, electrical machinery, and chemicals. Moreover, they find that these effects are economically very significant. They conclude that while economic geography may explain little about the international structure of production, it is very important for understanding the regional structure of production.

Martin and **Ottaviano** construct a model in which endogenous growth and industry location interact. They show that with global spillovers in R and D, a high growth rate and a high level of transaction costs are associated with relocation of newly created firms to the South (the location with low initial human capital). With local spillovers in R and D, this activity will be agglomerated in the North (the location with high initial human capital), and the rate of innovation will increase with the concentration of firms in the North. This in turn implies that a decrease in transaction costs through trade integration, for example, will increase the growth rate by leading to a higher industrial concentration of firms where the R and D is located. The authors show that industrial concentration improves welfare only for low enough transactions costs and high enough spillovers.

Krugman shows that the relationship between economic and technological progress and the geographical concentration of production is even more complex than we may have supposed. Not only may economic growth first foster then discourage concentration; at later phases, the trend may reverse itself. He suggests that there is an ongoing trend toward ever more differentiated demand. Increasing flexibility of production, essentially attributable to information technology, together with the growth of the world market, makes it possible to meet this demand for variety with a proliferation of goods. Meanwhile, transport costs are probably falling again—if nothing else because an increasing share both of output and of world trade either consists of goods with a high value per pound or of weightless services which can be transported cheaply if they can be transported at all. These propositions suggest that the story of the reconcentration of the U.S. auto industry could play itself out in other situations and circumstances.

In presenting a new analytical framework for assessing the impact of foreign direct investment on host economies, **Markusen** and **Venables** develop a model in which there are several industries that are linked through an input-output structure. The impact of an FDI project is felt in markets for final and intermediate goods, thus creating forward and backwards linkages. Under these circumstances, there is a tradeoff between competition effects, under which multinationals substitute for domestic industry, and linkage effects, creating complementarities. They use the model to show that the net effect of FDI on local industry may be complementary rather than competing, thus acting as a stimulus to host country industrial development. They conclude that their analysis points to the need to broaden the scope of standard project appraisal techniques to encompass linkages between related activities, and also to address the more difficult possibilities raised by cumulative causation.

The "new" economic geography literature focuses on two models: a model based on "footloose labor" and a model based on vertically-linked industries. Both models are complex since they feature demand-linked and cost-linked forces that encourage agglomeration. **Baldwin** presents a simpler model in which agglomeration is driven only by demand-linked circular causality. He analytically identifies the critical level of trade barriers below which the symmetric equilibrium is unstable. He also analytically derives the locational and welfare effects of unilateral liberalization and the formation of a customs union. The model's simplicity suggests that it may be useful for other applications, such as the introduction of endogenous growth and political economy considerations.

Puga analyzes how the degree of regional integration affects regional differences in production structures and income levels. With high transport costs, industry is spread across regions to meet final consumer demand. As transport costs fall, increasing returns interact with labor mobility, and/or with input-output linkages between firms, to create a tendency for the agglomeration of activities with increasing returns. When workers migrate towards locations with more firms and higher real wages, this intensifies the agglomeration. When workers instead do not move across regions, further reductions in transport costs make firms increasingly sensitive to wage differentials, leading industry to spread out again.

Beardsell and **Henderson** examine the spatial evolution of computers and electronic components across 317 metropolitan areas in the United States since the introduction of the personal computer. They start by examining the relative distribution of high-tech employment across cities, how that distribution changes from 1977–92, and how cities move through the distribution. The two industries show no tendency to settle down, nor any tendency of retrenchment during periods of national high-tech employment decline. There is a high degree of persistence in own-industry employment within cities, and no tendency for relative size distributions of high-tech employment to collapse or go bimodal. Overall, computers exhibit more turbulence, with more dramatic big winners and losers among cities. Electronic components seem to be more grounded, perhaps because of greater reliance on local market scale and urbanization economies. In attracting or repelling an industry, urban heterogeneity is important. Large, well educated cities near San Jose have a much greater chance of attracting high-tech employment, and less chance of losing it. For computers, the authors find strong evidence of significant, dynamic, own-industry externalities among non-affiliate plants. Corporate plants in computers seem to be self-reliant and not really influenced by externalities. For electronic components, there is no evidence of own-industry externalities. Agglomeration seems to be driven by urban characteristics and intra- and external-industry demand conditions.

Stahl and **Walz** investigate the simultaneous impact of imperfections in output and input markets on the characteristics and size of regional economic activity. Firms, producing imperfect substitutes, face product-specific demand shocks which translate into firm-specific shocks. The more different the products are, the less correlated the shocks. Larger regions also provide a better hedge for firms. With heterogeneity on the output side, labor demand of firms tends to become more heterogenous, leading to higher training costs for workers in the case of a job loss. Since adjustment costs prove to be higher in larger regions, workers demand higher wages there, imposing higher labor costs on firms. The authors analyze this trade-off and ask what are the resulting firm characteristics in different regions, the interregional wage dispersion, and the impact on the regional distribution of economic activity.

Duranton proposes a framework for comparing centralized and decentralized institutions when the agents populating the economy have a finite horizon. With decentralized institutions, coordination failures arise, and the allocation of factors is not efficient. Too many cities are developed with federalist structures, and economic activity does not agglomerate sufficiently. However, growth may be possible in the long run. On the other hand centralized institutions, for which the author proposes a general model of representative democracy, can manage productive activities efficiently and take full advantage of increasing returns. Still, limited time horizons induce rent seeking, and thus can prevent long-run growth.

Faini develops a simple model of regional development to show that (unskilled) unions will increase wages of unskilled workers and depress growth in both backward and advanced regions. The growth effects of union activity will be felt more strongly in the relatively poor regions, though. He also finds that the negative growth effects of union activity in the backward regions will be more marked when skilled workers are allowed to migrate and the unions cannot precommit to wage policies. However, if unions recognize that a more aggressive wagesetting policy may foster the migration of skilled workers and further depress the demand for unskilled labor, then they will moderate their wage demands, with a beneficial impact on growth. Different wagesetting institutions may affect the labor market and the growth outcome. With skilled labor migrations, regional unions will have a strong incentive to coordinate their wage requests across regions and to further raise the unskilled wage. Faini concludes that labor market policies designed to foster regional convergence should seek to discourage centralized wagesetting and, under some but not all circumstances, favor (skilled) labor mobility.

Combes shows how the economic structure influences local growth. Then he studies how local sectorial specialization and diversity, competition, average size of plants, and employment density between 1984 and 1993 affected employment growth in 341 French employment zones. He finds that industry and services do not follow the same dynamics. Employment density, competition, and large firms' size always reduce growth in industrial sectors. Specialization and diversity most often have a negative effect on growth, but may also foster the growth of a few sectors. In the service industries, never previously studied, negative specialization effects and positive diversity effects are always observed. Competition and firms' size have a negative impact and density a positive one, with some exceptions.

A broad conclusion coming out of the conference was that researchers in both international trade and economic geography can benefit significantly from learning more about the models and empirical studies in each other's field. The increasing numbers of scholars undertaking research in both fields indicates the validity of this proposition. Furthermore, as economic and political integration between countries and regions continues, the two fields themselves are likely to be integrated to an increasing extent.

20th Annual International Seminar on Macroeconomics

The National Bureau of Economic Research and the European Economic Association jointly sponsored the NBER's 20th Annual International Seminar on Macroeconomics (ISOM) in Switzerland this past June. Andrew K. Rose, NBER and University of California, Berkeley, served as co-chair and conference organizer. Guido Tabellini, IGIER, was co-organizer; Charles Wyplosz, Graduate Institute of International Studies, is the current ISOM co-chair. This year's program was:

Marianne Baxter and **Robert G. King**, NBER and University of Virginia, and **Urbann J. Jermann**, University of Pennsylvania, "Risk and Return Properties of NIPA Components: An International Comparison"

Discussants: Richard H. Clarida, NBER and Columbia University, and Walter Wasserfallen, Studienzentrum Gerzensee

David Backus, NBER and New York University, and **Mario Crucini** and **Chris Telmer**, "Properties of International Relative Prices"

Discussants: Urban J. Jermann, and Philippe Bachetta, Studienzentrum Genzensee

Ansgar Belke, Ruhr-Universitat Bochum, and **Daniel Gros**, Center for European Policy Studies, "Evidence on the Costs of Intra-European Exchange Rate Variability"

Discussants: Tamim Bayoumi, International Monetary Fund, and Jose Vinals, Bank of Spain

Maurice Obstfeld, NBER and University of California, Berkeley, "A Strategy for Launching the Euro"

Discussants: Peter Kenen, Princeton University; Luigi Spaventa, Universita Bocconi; and Charles Wyplosz

Richard H. Clarida; **Jordi Gali** and **Mark Gertler**, NBER and New York University, "Monetary Policy Rules in Practice: Some International Evidence"

Discussants: Marvin Goodfriend, Federal Reserve Bank of Richmond, and Torsten Persson, NBER and Harvard University

Olivier Jeanne, University of California, Berkeley, "Real and Nominal Rigidities Over the Business Cycle"

Discussants: Marianne Baxter, and Lucrezia Richlin, ECARE

Jean Pierre Danthine, University de Lausanne, **John B. Donaldson** and **Thore Johnsen**, Columbia University, "Productivity Growth, Consumer Confidence, and the Business Cycle"

Discussants: Robert Kollman, University of Paris, and Robert G. King

Fabio C. Bagliano, Universita di Torino, and **Carlo Favero**, Universita Bocconi, "Measuring Monetary Policy with VAR Models: An Evaluation"

Discussants: Stefan Gerlach, Bank for International Settlements, and James H. Stock, NBER and Harvard University

Baxter, Jermann, and **King** present some initial measurements of the risk and return characteristics of National Income and Product Accounts (NIPA) components, using the Campbell-Shiller [1988] model (which assumes constant expected returns). They find that the returns to NIPA components are more volatile than aggregate growth rates; and the returns to consumption, investment, and government purchases are very highly correlated with own-country output. The correlations between trade variables and output are weaker. Looking across countries, they find that the correlation between the returns on consumption are very similar to the correlation between the growth rates of these variables.

The variability and persistence of real exchange rates are one of the most striking features of international macroeconomic data. **Backus** and his co-authors examine prices in the G-7 [countries] for 28 manufactured goods, and document both similarities and differences across goods. They find that: 1) dispersion of prices across countries and across industries within countries are of similar magnitudes; 2) relative prices exhibit substantial reversion toward the mean, with half-lives of around two years; 3) there is substantial heterogeneity across goods, so that the standard deviations of prices across countries range from 10 percent for paper and non-ferrous metals to 24 percent for tobacco and 27 percent for petroleum refining.

Belke and **Gros** find that intra-European exchange rate variability has a statistically strong and economically negative impact on employment, production, and investment for EU countries (including France and Germany). They find no similar effect for dollar variability. This result holds up even accounting for the presence of policy variables that might have an impact on exchange rate variability. A more detailed study of an error-correction model for the German labor market confirms that there is a long-run relationship between the variability of the DM and unemployment in Germany.

Obstfeld studies the constraints placed by the Maastricht Treaty on the "conversion" rates at which member currencies will be transformed into the Euro at the start of stage 3 of economic and monetary union (EMU). He shows that the stage 3 bilateral conversion factors for EMU member currencies must correspond to closing market exchange rates as of December 31, 1998; furthermore, currency conversion rates into the Euro cannot be determined until that date. Moreover, official announcements about intended conversion factors will carry no credibility with markets, as market rates must be chosen over any preannounced rates according to the Treaty. Unless there is heavy official intervention in the runup to stage 3, EMU members' bilateral market rates will exhibit excessive volatility and may induce beggar-thy-neighbor policy behavior. On the other hand, exchange-rate targeting may open the door to speculative currency crises. The only feasible solution appears a widely-publicized institutional reform to subjugate national central banks' policies entirely to the goal of intra-EMU exchange stability in the final months of stage 2.

Clarida, Gali, and **Gertler** estimate monetary policy reaction functions for two sets of countries: the "G3" (Germany, Japan, and the United States) and what they call the "E3" (the United Kingdom, France, and Italy). They find that since 1979, each of the G3 central banks has pursued an implicit form of inflation targeting, which may account for the broad success of monetary policy within these countries over this time period. Also, these central banks have been forward looking: they respond to anticipated inflation as opposed to lagged inflation. Policymaking by the E3 has been far less cogent, though. Even prior to the emergence of the "hard ERM," the E3 central banks were influenced heavily by German monetary policy. Perhaps unsurprisingly, at the time of the EMS collapse, interest rates in each of the E3 countries were much higher than domestic macroeconomic conditions warranted. Taken together, the results support the view that some form of inflation targeting may be superior to fixing exchange rates, as a means to gain a nominal anchor for monetary policy.

Jeanne attempts to assess whether money can be an important source of output fluctuations in the framework of the literature on real business cycles. He shows that if labor supply is perfectly competitive, money shocks can explain a substantial fraction of output volatility only if nominal price rigidities are implausibly pervasive and persistent. However, introducing real wage rigidity into the model may reduce considerably the extent of nominal stickiness that is required for money to matter. He argues that given the level of real wage rigidity that is observed in developed countries, only a small degree of nominal stickiness is necessary for money to have large and persistent effects on output.

Danthine, Donaldson, and **Johnsen** analyze the implications of both systematic variations and single episodes of change in the labor productivity growth rate for business cycle phemomena. They also consider pure expectational changes: changes in expectations about the economy's growth rate not accompanied, within the sample period under study, by similar shifts in the actual growth rate of productivity. The context is a standard real business cycle style model. The authors show that macroeconomic variations induced by agents' changing expectations of their economy's growth rate, in conjunction with standard technology shocks, are consistent with the principal stylized facts of the business cycle. They also demonstrate that if agents' worse case fears are sufficiently extreme, variation induced by growth expectations alone can account for the majority of the variation in their economy's major macroaggregates. Reasonably pessimistic expectations, combined and correlated with standard level shocks, lead to business cycle fluctuations. Growth expectations' induced variation is, in some respects, fundamentally different from the variation induced by standard level shocks. Not only do the growth and level shocks have opposing effects on the enonomy's aggregate investment and labor supply decisions but also, for plausible parameterizations, the frequency of the growth fluctuations also frequently differs substantially from that induced by level shocks.

Bagliano and **Favero** evaluate monetary policy shocks derived from vector autoregression (VAR) models by considering three issues: specification, identification, and the effect of the omission of the long-term interest rate. Specification analysis suggests that only VAR models estimated on a single monetary regime feature parameter stability and do not show signs of misspecification. The identification analysis shows that VAR-based monetary policy shocks and policy disturbances identified from alternative sources show very little correlation but yield similar descriptions of the monetary transmission mechanism. Finally, the inclusion of the long-term interest rate in a benchmark VAR delivers a more precise estimation of the structural parameters capturing behavior in the market for reserves, and shows that contemporaneous fluctuations in long-term interest rates are an important determinant of the monetary authority's reaction function.

These papers will be published in a special edition of the *European Economic Review.*

Science and Technology Policy

The NBER's Project on Science and Technology Policy, directed by NBER Research Associate Adam B. Jaffe of Brandeis University, met on July 14 in Cambridge during the NBER's Summer Institute. NBER Research Associate Paul M. Romer of Stanford University, and David Mowery of University of California, Berkeley, served as organizers of the meeting, along with Jaffe. Forty representatives of universities, government agencies, and other research organizations joined in the discussion of the following papers:

Adam B. Jaffe, and **Manuel Trajtenberg,** NBER and Tel Aviv University, "Knowledge Flows Across Time and Space as Evidenced by Patent Citations"

Samuel S. Kortum, NBER and Boston University, and **Josh Lerner,** NBER and Harvard University, "Stronger Protection or Technological Revolution: What is Behind the Recent Surge in Patenting?"

Wesley Cohen, Carnegie Mellon University; **Richard R. Nelson,** Columbia University; and **John Walsh,** University of Illinois, "Appropriability Conditions and Why Firms Patent and Why They Do Not in the American Manufacturing Sector"

Andrew Toole, Laurits R. Christensen Associates, "The Impact of Federally Funded Basic Research on Industrial Innovation: Evidence from the Pharmaceutical Industry"

Ashish Arora, Carnegie Mellon University, and **Alfonso Gambardella,** University of Urbino (Italy), "The Impact of NSF Support for Basic Research in Economics"

Lee Branstetter, NBER and University of California, Davis, and **Mariko Sakakibara,** University of California, Los Angeles, "Japanese Research Consortia: A Microeconometric Analysis of Industrial Policy"

Jaffe and **Trajtenberg** use evidence from citations in patents to characterize the intensity and time path for knowledge flows across countries. Using a comprehensive database of all U.S. patents assigned between 1963 and 1993 to corporations whose inventors resided in the United States, United Kingdom, France, Germany, or Japan, and all citations to those patents contained in patents from 1977–94 from any of those five countries, they find: 1) there is a clear diffusion pattern to citations, with peak citation intensity occurring approximately 5 years after grant; 2) there is clear localization of citations, with cites from within the country generally coming faster and more intensely than cites from other countries; 3) there are variations across countries in the nature of technology, with Japan relatively more focused on recent technology and Germany relatively more focused on older technology.

Applications for U.S. patents by

U.S. inventors have increased more since 1985 (in either absolute or percentage terms) than in any other decade this century. The conventional wisdom is that U.S. patent holders have fared much better since the establishment by Congress in 1982 of the Court of Appeals of the Federal Circuit. **Kortum** and **Lerner** ask whether this institutional change, which should increase the propensity to patent inventions, explains the burst in U.S. patenting. Using both international and domestic data on patent applications and awards, they conclude that the jump in patenting may reflect an increase in U.S. inventive activity, spurred by either new technological opportunities or by advances in the management or technology of performing research itself.

Using data gathered by the 1994 Carnegie Mellon Survey on Industrial R and D in the U.S. manufacturing sector and, for comparison, those gathered by the 1983 Yale Survey on Appropriability and Technological Opportunity Conditions in the United States, **Cohen, Nelson,** and **Walsh** examine how firms appropriate their profits attributable to innovation, how they change those strategies over time, and why firms patent. They find that in most industries, firms use a range of mechanisms to protect a given innovation, particularly lead-time, secrecy, and complementary capabilities. Relative to the other appropriability mechanisms, it turns out, patents are no more effective in 1994 than in 1983, despite considerable strengthening of their legal enforcement since the early 1980s. The clearest change since 1983 is that firms now rely much more heavily on secrecy in protecting their product innovations than they had previously. Consistent with that, the fear of disclosure of information is now one of the most important reasons for not applying for a patent, while in 1983 the most important reason given was the ease of legally inventing around the patent. The key reasons for patenting, other than the prevention of copying, are to prevent other firms from patenting a related invention (that is, patent blocking); for use in negotiations; and to prevent suits. Patent blocking is a much more pervasive motive than previously thought.

Building a foundation of basic research knowledge through Federal sponsorship has been an explicit and well articulated goal of U.S. national research policy since the end of World War II. Although billions of Federal dollars are being spent each year to support our national research enterprise, little has been done to understand how the resulting stock of public knowledge affects industrial productivity. **Toole** explores the direct productivity impact of U.S. government funded basic research on pharmaceutical innovation. He finds that the stock of public basic research is a key factor in bringing new therapeutic compounds to market. He also finds that public basic research and private R and D are complementary in the production of new compounds, with the estimated return to public research being 43 percent greater than the return to private R and D. Moreover, access to the stock of public basic research leads to industry-wide increasing returns to scale in the discovery and development of new compounds.

Arora and **Gambardella** study the relationship between NSF funding and the publications of U.S. economists using data on 1473 applications to NSF during 1985–90, 414 of which were awarded a research grant. They find that even after controlling for reviewer scores and the observed quality of the principal investigator (PI), the institutional affiliation, sex, and geographical location of the PI affect the likelihood of successfully getting an NSF grant. Past performance also affects expected budget received through the probability of being selected and in an indirect way: PIs with better track records ask for larger budgets; thus, a PI with a better track record has a higher probability of being selected, and given selection, gets a constant fraction of a larger requested budget. The effect of NSF funding seems to be more pronounced at earlier stages of the economists' careers. For example, for a selected young PI, an additional $10,000 grant would produce 10 more (quality-adjusted) publication units. In turn, this corresponds to one single-authored paper in *The Journal of Money, Credit and Banking* or *The Canadian Journal of Economics*. The marginal product of NSF funding (given selection) is close to zero for those who received their Ph.D. between 5 and 15 years earlier, and is somewhat higher for senior researchers.

Branstetter and **Sakakibara** undertake the first large-sample study of Japanese government-sponsored research consortia which uses firm-level data on research inputs and outputs to measure the impact of participation on the ex-post research productivity of the firm. They find that frequent participation in these consortia has a positive impact on research expenditure and research productivity. Further, they find that part of this impact arises from the increased knowledge spillovers that take place within these consortia. Not only are these results useful in providing empirical evidence on the theory of research joint ventures, but they also shed light on the question of what role Japanese "industrial policy" played in Japanese technological innovation during the 1980s.

1997 Franco-American Seminar

Nearly 50 economists from the United States, Canada, and Europe met in Cambridge on July 23–25 during the NBER's Summer Institute for the annual Franco-American Seminar. This year's meeting, on "Medical Care Output and Productivity," was organized by David M. Cutler of NBER and Harvard University and Jacques Mairesse, NBER and INSEE. Five papers were presented and discussed:

Pierre-Andre Chiappori, Frank Durand, and **Pierre-Yves Geoffard,** DELTA, "Moral Hazard and the Demand for Physician Services: Lessons from a French Natural Experiment"

Benoit Dervaux and **Herve Leleu,** Catholic University of Lille, "Productive Efficiency of Hospital Services and Quality of Care"

Stephane Jacobzone, INSEE-CREST, "A Hedonic Insight into the Pricing of French Prescription Drugs"

Cecile Fortanier, Jean-Paul Moatti, and **Louis-Andre Gerard-Varet,** Universite de la Mediterranee, "A Research and Development Case in the Biotechnology Field: Cell Therapy"

Alberto Holly, University of Lausanne, "Health Insurance and Health Care Utilization in Switzerland"

Chiappori and his co-authors study the demand for medical care. They use a longitudinal dataset on 4578 individuals followed over a two-year period. The dataset contains two subgroups: one (3869 individuals) for which a copayment rate of 10 percent for physician visits was introduced in 1994; and another (889 individuals) for which no change occurred during the period under study. The authors find that the introduction of a copayment rate of 10 percent did not modify the number of visits per agent, except for physicians' home visits. This suggests that demand may be fairly inelastic if there are only small changes in relative price.

Dervaux and **Leleu** first gauge the bias caused by omitting quality of care in the specifications of a hospital's production function. Then they check for economies of scale and scope in the provision of hospital care. Finally, they assess the indirect costs of training interns. They conclude that incorporating quality of care alters estimates of the ideal ward size. However, they find no connection between the size of a hospital and the efficiency or productivity of its wards.

The introduction of new goods and technologies may bias price indexes. Technological factors also may be affected by environmental and regulatory characteristics, as is often the case in health care. **Jacobzone** uses a linked dataset on French prescription drugs which includes 14 years of firms' products (1980–93) covering about 30 percent of the market. He finds that using estimates that do not correct for product quality leads to a downward bias averaging 20 to 30 percent for the official drug price index.

Fortanier examines the development of new biotechnologies and its regulation in France. He focuses particularly on bone marrow transplantation. He concludes that traditional regulatory models are not likely to work well in the case of new biotechnology products, and that new regulatory processes should recognize the bargaining among the different participants in biotechnology development.

Holly analyzes how different plans affect the utilization of health care services in Switzerland. His data come from the 1992–3 Swiss Health Survey. The main health insurance plans at that time were: 1) a "basic insurance" plan; 2) a complementary "semi-private" insurance plan; and 3) a complementary "private" insurance plan. These plans varied along several dimensions: coverage of inpatient and outpatient services; coverage of allied health personnel; and payment system of care providers for each procedure or service.

Bureau News

Montgomery is Chief Economist at Labor Department

Edward B. Montgomery, who has been a member of the NBER's Program in Labor Studies since 1989, became the Chief Economist of the U.S. Department of Labor in January 1997. He is the latest in a succession of NBER Research Associates to fill that office: he follows Lisa M. Lynch of Tufts University; Alan B. Krueger of Princeton University; and Lawrence F. Katz of Harvard University. Montgomery is on leave from his teaching post at the University of Maryland and from the NBER.

1997 Summer Institute

Over 1100 economists from universities and organization in 21 countries attended the NBER's 19th Annual Summer Institute. This year's program was funded primarily by a grant from the Lynde and Harry Bradley Foundation, with additional support from the National Science Foundation and the National Institute on Aging. The papers presented at dozens of different sessions during the four-week summer institute covered a wide variety of topics. A list of all papers and work in progress can be obtained by writing to: Summer Institute Catalogue, NBER, 1050 Massachusetts Avenue, Cambridge, MA 02138-5398.

Economic Fluctuations and Growth Program Meeting

Nearly one hundred members and guests of the NBER's Program on Economic Fluctuations and Growth, representing universities and central banks from around the world, gathered in Cambridge on July 19 for the group's annual summer research meeting. Valerie Ramey, NBER and University of California, San Diego, and David H. Romer, NBER and University of California, Berkeley, organized the meeting and chose these papers for discussion:

Steven J. Davis, NBER and University of Chicago, and **John C. Haltiwanger,** NBER and University of Maryland, "Sectoral Job Creation and Destruction Responses to Oil Price Changes and Other Shocks"
Discussant: Michael Horvath, Stanford University

Joao Gomes and **Jeremy Greenwood,** University of Rochester, and **Sergio Rebelo,** NBER and University of Rochester, "Equilibrium Unemployment" (NBER Working Paper No. 5922)
Discussant: Monika Merz, Rice University

Francesco Daveri, University of Brescia, and **Guido Tabellini,** Bocconi University, "Unemployment, Growth, and Taxation in Industrial Countries"
Discussant: Xavier Sala-i-Martin, NBER and Universitat Pompeu Fabra

Alwyn Young, NBER and University of Chicago, "The Razor's Edge: Distortions and Incremental Reform in the People's Republic of China"
Discussant: Robert E. Hall, NBER and Stanford University

Raghuram Rajan, NBER and Northwestern University, and **Luigi Zingales,** NBER and University of Chicago, "Financial Dependence and Growth" (NBER Working Paper No. 5758)
Discussant: Charles Jones, Stanford University

Nobuhior Kiyotaki, NBER and University of Minnesota, and **John Moore,** London School of Economics, "Credit Chains"
Discussant: Mark Gertler, NBER and New York University

Davis and **Haltiwanger** study the effects of oil price changes and other shocks on the creation and destruction of U.S. manufacturing jobs from 1972 to 1988. They find that: 1) Oil shocks account for about 20–25 percent of the cyclical variability in employment growth under their identifying assumptions, twice as much as monetary shocks. 2) Employment growth shows a sharply asymmetric response to oil price ups and downs, in contrast to the prediction of standard equilibrium business cycle models. 3) The two-year employment response to an oil price increase rises (in magnitude) with capital intensity, energy intensity, and product durability. 4) The response to monetary shocks rises with product durability and the fraction of employment in young plants. 5) Job destruction shows much greater short-run sensitivity to oil and monetary shocks than job creation in every sector with the clear exception of young, small plants. 6) Oil shocks generate important reallocative effects. A positive oil shock of one standard deviation leads to a four-year cumulative increase in job reallocation that exceeds 3 percent of employment; 85 percent of this response reflects greater job reallocation within manufacturing.

Gomes, Greenwood, and **Rebelo** develop a model of the natural rate of unemployment. Their model of frictional unemployment is consistent with the key regularities of unemployment over the business cycle. In the model, the return to a job moves randomly. Agents can choose either to quit and search for a better job, or to continue working. Search generates job offers that agents can accept or reject. Two distinguishing features of this work relative to the existing business cycle literature on labor market fluctuations are: 1) the decision to accept or reject jobs is modeled explicitly; and 2) there is imperfect insurance against unemployment.

Daveri and **Tabellini** argue that increases in unemployment and slowdowns in economic growth are related, because they stem from a common cause: an extremely high cost of labor. In industrial countries, labor costs have gone up for many reasons, but one is particularly easy to identify: higher taxes on labor. If wages are set by strong and centralized trade unions, an increase in labor taxes is shifted onto higher real wages. This has two effects. First, it reduces labor demand, and thus creates unemployment. Second, as firms substitute capital for labor, the marginal product of capital falls. Over long periods of time, this in turn diminishes the incentive to accumulate and thus to grow. Thus high unemployrnent is associated with low growth rates. The effect of labor taxation differs sharply in countries with different labor market institutions, though. Using data for 14 industrial countries between 1965 and 1991, the authors find that a rise of about 9 percentage points in labor tax rates can account for a reduction in the EU growth rate of about 0.4 percentage points a year, about one-third of the observed reduction in growth between 1965–75 and 1976–91, and a rise in unemployment rates of about 4 percentage points.

Young argues that one of the perils of gradualist reform is that, by its nature, it creates long lasting opportunities to obtain economic rents. This allows for a prolonged battle to capture, and then protect, these rents, leading to the creation of new distortions in the economy. Focusing on the experience of China, Young explains that under the central plan raw material prices were kept low and final goods prices high, generating substantial surpluses in manufacturing and processing industries, which funded the government budget. As central controls were relaxed, local governments throughout China moved to develop manufacturing industries in an attempt to capture the rents implicit in the centrally mandated price wedges. The elimination of central controls over prices and the growth of interregional free marketing threatend industrial profit margins and led to interregional trade conflicts, as local governments tried to control prices and limit "foreign" competition using a variety of administrative and physical barriers to trade. Thus, although the Chinese economy has become more open internationally, it has become more fragmented internally.

Does the state of development of a country's financial markets 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. **Rajan** and **Zingales** examine whether financial development facilitates economic growth by scrutinizing one rationale for such a relationship: that financial development reduces the costs of external finance to firms. Specifically, they ask whether industrial sectors that are relatively more in need of external finance develop disproportionately faster in countries with more developed financial markets. They find this to be true in a large sample of countries over the 1980s. They show that this result is unlikely to be driven by omitted variables, outliers, or reverse causality.

Kiyotaki and **Moore** study how shocks propagate through networks of firms which borrow from, and lend to, each other. In particular, they investigate how a small, temporary shock to the liquidity of some firms may cause a chain reaction in which other firms get into financial difficulties, thus generating a large, persistent fall in aggregate activity. Also, they look at the aggregate effects of creditors' postponing the debt of delinquent debtors, rather than liquidating their assets. They show that, although it may be bilaterally efficient for a creditor and a debtor in one link of a credit chain to reschedule debt, postponement can have serious social consequences because no new liquidity is injected into the system. Finally, they demonstrate that firms may decide privately not to insure against the risk of default by their debtors, even though such insurance may be available.

Social Security Project Meeting

On August 6, participants in the NBER's Project on Social Security, under the direction of Bureau President Martin S. Feldstein, met in Cambridge to discuss recent research in their field. They were joined by a number of representatives of government agencies that have a particular interest in Social Security and its possible reform. The day's program was:

Martin S. Feldstein, NBER and Harvard University, and **Andrew Samwick**, NBER and Dartmouth College, "The Economics of Prefunding Social Security and Medicare Benefits" (NBER Working Paper No. 6055)

Jan Walliser, Congressional Budget Office, "Understanding Adverse Selection in the Annuities market and the Impact of Privatizing Social Security" and "Privatizing Social Security While Limiting Adverse Selection in Annuities Markets"

Gordon P. Goodfellow and **Sylvester J. Schieber**, Watson Wyatt Worldwide, "Social Security Reform: Implications of Individual Accounts on the Distribution of Benefits"

Kent Smetters, Congressional Budget Office, "Investing the Social Security Trust Fund into Equity: An Options Pricing Approach"

Gary S. Becker, University of Chicago, and **Tomas Philipson**, NBER and University of Chicago, "Mortality Contingent Claims, Health Care, and Social Insurance" (NBER Working Paper No. 5760)

Rodrigo Cifuentes, Harvard University, and **Salvador Valdes-Prieto**, Catholic University of Chile, "Forced Saving and Pension Reform in the United States"

Antonio Rangel, Harvard University, and **Richard J. Zeckhauser**, NBER and Harvard University, "Social Security Reform: Efficiency Gains versus Intergenerational Redistribution"

Feldstein and **Samwick** present a detailed analysis of the economics of prefunding benefits for the aged, focusing on Social Security but indicating some of the analogous magnitudes for prefunding Medicare benefits. They use Census and Social Security information to model the transition to a fully funded system based on mandatory contributions to individual accounts. The funded system would permanently maintain the level of benefits now specified in current law and would require no new government borrowing (other than eventually selling the bonds that are officially in the Social Security trust fund). During the transition, the combined rate of payroll tax and mandatory saving rises initially by 2 percentage points (to a total of 14.4 percent) and then declines so that, in less than 20 years, it is less than the current 12.4 percent payroll tax. They show that the combination of higher pretax wages and lower payroll taxes could raise wages net of income and payroll taxes by more than 35 percent in the long run. Further, a small increase in the mandatory saving rate would reduce the risk of receiving less than the scheduled level to less than 1 percent.

Individuals who expect to live longer are likelier to buy annuities; this "adverse selection" forces insurance companies to charge higher premiums than average survival probabilities would imply. **Walliser** calculates the degree of adverse selection in a characteristic sample of the U.S. population, with survival probabilities based on income, race, and marital status. He finds that the annuity premiums for 65-year-old males exceed those based on average survival probabilities by 7 to 10 percent. Second, adverse selection increases with the age of the annuitant. Third, the adverse selection problem is smaller in the annuities market for females than in the market for males. Although eliminating Social Security may reduce the increase in annuity prices induced by adverse selection by 1 to 2.5 percentage points, it cannot remove it entirely. Moreover, a significant share of the measured adverse selection is attributable to the positive correlation between longevity and income, and cannot be eliminated with a mandatory annuity that increases with the income of the annuitant.

Goodfellow and **Schieber** conclude that there are virtually no policy options, including personal saving accounts, that are likely to provide currently promised Social Security benefits to the baby boomers without substantially higher contribution rates than we are now incurring. Some baby boomers are likely to see reduced benefit levels relative to current law promises, and these are likely to be largest for the middle cohorts of the baby boomers. In the long term, though, Social Security reforms, including some level of personal account funding, would lead to improved benefit levels for significant segments of future retiree populations.

Using an options pricing approach, **Smetters** analyzes the three basic allocations of risk among generations from investing the Social Security trust fund into equity. That approach produces surprisingly sharp and robust "equivalency relationships."

These equivalency relationships not only identify identical fiscal policies —thereby unmasking the intergenerational redistribution of various risk allocations—but they also enable a precise calculation of their value. He shows that the *defined-contribution* (DC) risk allocation—in which there is no intergenerational risk shifting—is consistent with the commonly-stated "shell game" scenario that involves a swap between private and public pensions with no price effects. The current-law *defined-benefit* (DB) approach, and the approach being implied by some proposals to invest the trust fund into equity, uses the payroll tax to smooth equity gains or losses across generations in order to fix the benefit level. This is mathematically equivalent to an intergenerational transfer on a pay-as-you-go basis of put and call stock options (that is, a futures contract) that insures that the equity portion of the trust fund performs as expected. This creates an instant windfall for current workers, contracts the expected-value budget constraints for all future workers, and reduces national saving relative to the baseline policy of maintaining the current payroll tax rate. Most importantly, the DB allocation places an actuarial tax liability on future workers that is equivalent to keeping the trust fund invested in bonds and instead raising the same expected revenue by increasing the payroll tax on *only* future workers—a result that holds for any value of risk aversion. Indeed, future generations would be better off if the explicit payroll tax is increased immediately so that current workers participated in maintaining their own future level of benefits. This equivalency result is ironic given the strong political resistance to increasing the payroll tax under the current-law DB system, especially by those advocating trust fund investment into equity as an alternative. In the *asymmetric* (ASY) risk allocation, trust-fund equity returns below expectation are buffered with an increase in the payroll tax, while returns in excess of the payroll tax are met with an increase in benefits (rather than a reduction in taxes as in the DB approach). This is a more extreme form of the DB approach and is mathematically equivalent to an intergenerational transfer on a pay-as-you-go basis of only put options that insure that the equity portion of the trust fund performs *at least* as expected. Smetters prices and compares the ASY plan with the DB plan and discusses how the results might change if markets are incomplete. He argues that the complete market analysis underlying the options pricing approach might, under certain conditions, overstate the actuarial costs associated with these three risk allocations but that there are also very compelling reasons why the complete-market analysis might understate the true costs.

Becker and **Philipson** analyze the impacts of savings and longevity on "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 postwar increase in mandatory annuity and life insurance programs, as well as the rapid increase in life expectancy at older ages, motivates a better understanding of the effects that mortality contingent claims have on health investments. Furthermore, annuity income involves moral hazard effects through increasing longevity; among other things, this introduces a positive interaction between public programs for health care and income support for the elderly, programs that have grown enormously in developed countries.

Cifuentes and **Valdes-Prieto** show that a mandate to save for old age in funded accounts has a substantial positive impact on saving and the capital stock. They summarize the mechanics of pension reform and describe the two main challenges faced by Social Security in the United States, namely that current benefit and contribution rates are unsustainable, and that the pay-as-you-go financing method has been shown to be vulnerable to demographic shocks. Finally, they propose a pension reform package for the United States where the reforms needed to deal with these two challenges are made politically viable by compensating perceived and actual losers with the gains obtained from mandating savings for old age in funded accounts.

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Bureau Books

Macro Annual, Volume 12

NBER Macroeconomics Annual 1997, Volume 12, edited by Ben S. Bernanke and Julio J. Rotemberg, is now available from the MIT Press for $20.00.

This latest volume in the annual series includes the papers and discussions presented at last spring's conference in Cambridge. The first two papers in the volume, by Marvin Goodfriend and Robert King and Julio Rotemberg and Michael Woodford, respectively, focus on various issues in monetary policy; another paper by Peter Klenow and Andres Rodriguez reviews the revival in growth economics; one study by Michael Gavin and Roberto Perotti considers fiscal policy in Latin America; in their paper, Bureau President Martin Feldstein and co-author Andrew Samwick consider the economics of prefunding Social Security and Medicare benefits; and, a final paper by Christopher Carroll and Wendy Dunn analyzes the effect of unemployment expectations on household balance sheets. Given the wide range of topics, this volume should be of interest to anyone with a background in economics.

Bernanke and Rotemberg are research associates in the NBER's Programs in Economic Fluctuations and Growth and Monetary Economics. Bernanke teaches at the Woodrow Wilson School at Princeton University; Rotemberg teaches at Harvard Business School.

The following volume may be ordered directly from the University of Chicago Press, Order Department, 11030 South Langley Avenue, Chicago, IL 60628-2215; 1-800-621-2736. Academic discounts of 10 percent for individual volumes and 20 percent for standing orders for *all* NBER books published by the University of Chicago Press are available to university faculty; orders must be sent on university stationery.

The Regionalization of the World Economy

The Regionalization of the World Economy, edited by Jeffrey A. Frankel, is now available from The University of Chicago Press for $43.00. In recent decades the world economy has undergone increasing "regionalization": regional trading alliances, such as currency blocs, free trade areas (FTAs), and regional trade arrangements have become prevalent. Economists agree that regionalism is likely to characterize the world economy for some time. In late October of 1995, Frankel organized an NBER conference to study economic regionalism. *The Regionalization of the World Economy*, which includes both theoretical and empirical studies of the topic, is the product of that conference.

The volume addresses several large questions. Why do countries adopt FTAs and other regional trading arrangements? To what extent have existing regional arrangements actually affected patterns of trade? What are the welfare effects of such arrangements? Several chapters that focus on the econometric exploration of the effects of regional arrangements make extensive use of the gravity model of bilateral trade, and the volume includes a chapter that explores the theoretical foundation of the gravity model.

This volume should interest trade policymakers as well as international economists. Frankel, currently on leave from the NBER as a member of the Council of Economic Advisers, was director of the NBER's Program in International Finance and Macroeconomics and a professor of economics at the University of California, Berkeley when he organized this conference.

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

Abstracts of all papers issued since July 1997 are presented below. For previous papers, see past issues of the *NBER Reporter*. Working Papers are intended to make results of NBER research available to other economists in preliminary form to encourage discussion and suggestions for revision before final publication. They are not reviewed by the Board of Directors of the NBER.

NBER Working Papers

Interests, Institutions, and Ideology in the Republican Conversion to Trade Liberalization, 1934–1945

Douglas A. Irwin and Randall S. Kroszner
NBER Working Paper No. 6112
July 1997
JEL Nos. D72, D78, F13, N72
Development of the American Economy and International Trade and Investment

We investigate what factors explain significant changes in policy by studying how bipartisan support developed to sustain the Reciprocal Trade Agreements Act (RTAA) of 1934. The RTAA fundamentally transformed both the process and the outcome of U.S. trade policy: Congress delegated its authority over tariff-setting to the President, and the United States then moved sharply toward trade liberalization. The durability of this change was achieved only when the Republicans, long-time supporters of high tariffs who originally vowed to repeal the RTAA, began to support this Democratic initiative in the 1940s. In seeking to explain this conversion, we do not find an ideological shift among Republicans, but rather an increased sensitivity to export interests. The institutional structure of the RTAA itself may have been responsible for this shift. Our results suggest that analyzing changes in both institutional incentives and economic interests are important for understanding lasting change in economic policy.

Trade and the Transmission of Technology

Wolfgang Keller
NBER Working Paper No. 6113
July 1997
JEL Nos. O3, O4, F12, F2
International Trade and Investment and Productivity

I present a model of R and D-driven growth which predicts that technology, in the form of product designs and created through R and D investments, is transmitted to other domestic and foreign sectors by being embodied in differentiated intermediate goods. I present empirical results based on data from 13 manufacturing industries in eight OECD countries from 1970 to 1991.

I first confirm earlier findings that R and D expenditures are related positively to productivity levels. I estimate an elasticity of total factor productivity (TFP) with respect to own-industry R and D of between 7 percent and 17 percent. The receiving industry also benefits from other industries' technology investments, an effect which is at least in part attributable to trade in embodied technology. I find that the benefit derived from foreign R and D in the same industry is in the order of 50 percent to 95 percent of the productivity effect of own R and D. Further, for domestic interindustry technology flows, the results strongly suggest that trade in goods is not all that matters for technology transmission. I estimate that domestic, outside-industry R and D is one fifth to one half as effective in raising productivity as own-industry R and D for these industries.

The Medical Costs of The Young and Old: A Forty-Year Perspective

David M. Cutler and Ellen Meara

NBER Working Paper No. 6114
July 1997
Aging, Health Care, and
Public Economics

In this paper, we examine the growth in spending on medical care by age over the past 40 years. We show that between 1953 and 1987, medical spending increased disproportionately for infants, those under the age of one, and the elderly, those aged 65 and above. Annual spending growth for infants was 9.8 percent, and growth for the elderly was 8.0 percent, compared to 4.7 percent for people aged 1–64. Within the infant and the elderly populations, excess spending growth was driven largely by more rapid growth of spending at the top of the medical spending distribution. Aggregate changes in outcomes for infants and the elderly are consistent with these changes in spending growth, but we do not present any causal evidence on this point.

Violations of the "Rules of the Game" and the Credibility of the Classical Gold Standard, 1880–1914

Michael D. Bordo and Ronald MacDonald

NBER Working Paper No. 6115
July 1997
JEL Nos. F31, F33, N23
Development of the American Economy, International Finance and Macroeconomics, and Monetary Economics

We examine the recently noted finding that the Classical gold standard represented a credible, well-behaved target zone system from the perspective of the well-documented failure of countries to play by the rules of the game in the Classical period. In particular, we test a hypothesis of Svensson [1994] that a credible target zone can confer a degree of independence in the operation of a country's monetary policy. We propose a number of ways of testing this proposition and implement them for a newly created monthly database over the period 1880–1913. We demonstrate that the Classical gold standard worked as predicted by Svensson's model. This would seem to have an important bearing on the kind of institutional framework required for a modern-day target zone (such as the Exchange Rate Mechanism of the European Monetary System) to function effectively and, in particular, to weather speculative attacks.

Taxed Avoidance: American Participation in Unsanctioned International Boycotts

James R. Hines, Jr.

NBER Working Paper No. 6116
July 1997
JEL Nos. F23, H87, F13
International Trade and Investment and Public Economics

American firms are subject to tax and civil penalties for participating in international boycotts (other than those sanctioned by the U.S. government). These penalties apply primarily to American companies that cooperate with the Arab League's boycott of Israel. The effectiveness of U.S. antiboycott legislation is reflected in the fact that American firms comply with only 30 percent of the 10,000 boycott requests they receive annually. The cross-sectional pattern is informative: the U.S. tax penalty for boycott participation is an increasing function of foreign tax rates, and reported compliance rates vary inversely with tax rates. Tax rate differences of 10 percent are associated with 6 percent differences in rates of compliance with boycott requests. This evidence suggests that U.S. antiboycott legislation significantly reduces the willingness of American firms to participate in the boycott of Israel, reducing boycott participation rates by as much as 15–30 percent.

Misconceptions and Political Outcomes

David Romer

NBER Working Paper No. 6117
July 1997
JEL No. D72
Economic Fluctuations and Growth, Monetary Economics, and Public Economics

A large recent literature shows that strategic interactions among actors with conflicting objectives can produce inefficient political decisions.

This paper investigates an alternative explanation of such decisions: if individuals' errors in assessing the likely effects of proposed policies are correlated, democratic decisionmaking can produce inefficient outcomes even in the absence of distributional conflicts or heterogeneous preferences. Choosing candidates from among the best informed members of the population does not remedy the problems created by such errors, but subsidizing information and then exposing representatives to information after their election do. Concentration of power has ambiguous effects. Finally, the presence of correlated errors tends to create multiple equilibriums in political institutions.

Why are Worker Cooperatives So Rare?

Michael Kremer

NBER Working Paper No. 6118
July 1997
JEL Nos. D23, J54
Labor Studies

I argue that worker cooperatives are prone to redistribution among members, and that this redistribution distorts incentives. I assume that employment contracts are incomplete. In the model, cooperative members pay in a capital contribution to purchase equipment. Then they receive "shocks" to ability. Each worker's (observable) output depends on ability and on effort, neither of which can be observed separately. After ability is realized, members vote on a wage schedule as a function of output. If the median member has less-than-average ability, then the cooperative will vote for a redistributive schedule, dulling incentives. Whereas workers in firms owned by outside shareholders would quit if the firm redistributed away from them, cooperative members will be reluctant to leave, since this entails forfeiting the dividends on their capital contribution. This model can explain why cooperatives typically have egalitarian wage policies.

Quantifying the Current U.S. Fiscal Imbalance

Alan J. Auerbach

NBER Working Paper No. 6119
August 1997
JEL No. H6
Public Economics

This paper considers the magnitude of the U.S. fiscal imbalance, as measured by the permanent changes needed to stabilize the national debt as a share of GDP. At present, even after recent improvements in forecast deficits, this imbalance stands at 5.3 percent of GDP, several times the magnitude of the current official deficit. The imbalance is primarily attributable to the growth of Medicare, Medicaid, and Social Security.

Addressing an imbalance of this size will require significant policy changes. Even if current projected reductions in other government spending occur, and policies are adopted to eliminate the estimated imbalance in OASDI and to balance the federal budget in 2002, an *additional* and immediate reduction in the primary deficit of 2.7 percent of GDP will be required to establish a feasible fiscal policy. Waiting to adopt policy changes will increase the size of the required annual reduction in the primary deficit.

How to Compete: The Impact of Workplace Practices and Information Technology on Productivity

Sandra E. Black and Lisa M. Lynch

NBER Working Paper No. 6120
August 1997
JEL Nos. D24, J24, J33, J51
Labor Studies

Using data from a unique nationally representative sample of businesses—the Educational Quality of the Workforce National Employers Survey—matched with the Longitudinal Research Database of the Bureau of the Census, we examine the impact of workplace practices, information technology, and investments in human capital on productivity. We estimate an augmented Cobb-Douglas production function with both cross-section and panel data covering 1987–93. We find that what is associated with higher productivity is not so much whether an employer adopts a particular work practice but rather how that work practice is actually implemented within the establishment. We also find that those unionized establishments that have adopted what have been called new or "transformed" industrial relations practices which promote joint decisionmaking, coupled with incentive-based compensation, have higher productivity than other similar nonunion plants. Those businesses that are unionized but maintain more traditional labor management relations have lower productivity. We also find that the higher the average educational level of production workers, or the greater the proportion of nonmanagerial workers who use computers, the higher is plant productivity.

Estimation of Cross-Country Differences in Industry Production Functions

James Harrigan

NBER Working Paper No. 6121
August 1997
JEL Nos. F1, D24
International Trade and Investment

Many economists and policymakers are concerned about international differences in technology and labor quality, correctly seeing these issues as crucial to long-term growth in living standards. Typically, international trade economists assume that technological knowledge is the same in all countries, and that production processes exhibit constant returns to scale. An equivalent way of stating this assumption is that total factor productivity (TFP) for each industry is the same in every country. This paper contributes to a growing body of work which casts doubt on this hypothesis, finding large and persistent TFP differences across countries. I use a new dataset on prices, inputs, and outputs for a group of industrialized countries in the 1980s. In addition to calculating industry-specific TFP indexes over time and across countries, I use panel data techniques to examine the sources of the observed large TFP differences across countries. In particular, I examine two hypotheses to account for TFP differences: constant-returns-to-scale production with country-specific technological differences, and industry-level scale economies with identical technology in each country. The data support the constant returns/different technology hypothesis.

Strategies for Controlling Inflation

Frederic S. Mishkin

NBER Working Paper No. 6122
August 1997
JEL No. E5
Economic Fluctuations and Growth and Monetary Economics

This paper examines what strategies policymakers have used to both reduce and control inflation. It first outlines why a consensus has emerged that inflation needs to be controlled. Then it examines four basic strategies: exchange rate pegging; monetary targeting; inflation targeting; and the "just do it" strategy of preemptive monetary policy with no explicit nominal anchor. The discussion highlights the advantages and disadvantages of each strategy and sheds light not only on how disinflation might best be achieved, but also on how hard won gains in lowering inflation can be locked in.

Controlled Openness and Foreign Direct Investment

Joshua Aizenman and Sang-Seung Yi

NBER Working Paper No. 6123
August 1997
JEL Nos. F15, F21
International Trade and Investment

This paper explains why a developing country may adopt a partial reform under which foreign direct investments are controlled. We consider a country where the ruling elite (referred to as State capital) prevents the entry of "Foreign capital" and taxes the private sector before reform. The impetus to reform comes from the improved productivity of Foreign capital. The reform diminishes the ability of State capital to tax the private sector, but allows it to extract payment from Foreign capital for access to its markets. We show that the higher productivity of Foreign capital always increases the attractiveness of a partial reform, under which State capital can control the inflow of Foreign capital. In contrast, the higher productivity of Foreign capital can reduce the attractiveness of a full reform, under which the entry of Foreign capital is not regulated. Our analysis implies that, when the impetus to reform comes from improvements in Foreign productivity, State capital's exercise of control over Foreign capital's inflow may be a *necessary* condition for the reform to take place at all. In the absence of such a control, State capital may be reluctant to carry out the efficiency-enhancing reforms.

Dynamic Modeling of the Product Life Cycle in the Commercial Mainframe Computer Market, 1968–1982

Shane M. Greenstein and James B. Wade

NBER Working Paper No. 6124
August 1997
Productivity

This research investigates product life cycles in the commercial mainframe computer market. We show that empirical studies conducted at the product level are useful for investigating processes underlying product life cycles. We use hazard models with time-varying covariates to estimate the probability of product exit and Poisson models to estimate the probability of introduction. We measure the importance of different aspects of market structure, such as the degree of competitiveness, cannibalization, vintage, product niche, and firm effects. We find some evidence of a relationship between the determinants of product exit and product entry.

The Effect of U.S. Supreme Court Ruling *Sullivan v. Zebley* on Child SSI and AFDC Enrollment

A. Bowen Garrett and Sherry Glied

NBER Working Paper No. 6125
August 1997
JEL No. I18
Health Care and Health Economics

In 1990 in the case of *Sullivan v. Zebley*, the U.S. Supreme Court substantially relaxed the criteria whereby children became eligible for Supplemental Security Income (SSI) benefits. Since the ruling took effect, the number of children covered by SSI has almost tripled. Currently, nearly one million American children are receiving cash and medical benefits through SSI. Many of those newly enrolling in SSI were not previously eligible for cash and Medicaid benefits. Other new eligibles already had been receiving cash and Medicaid through AFDC.

This paper examines the extent of spillovers between the SSI and AFDC programs. We use the *Sullivan v. Zebley* expansion in child SSI enrollment to identify spillovers between the programs. We describe how a family's decision to participate in AFDC or SSI is likely to depend on the level of AFDC and SSI supplementation payments in a state. If the likelihood of SSI participation increases with the net financial gain of SSI relative to AFDC, child SSI participation over the period affected by *Zebley* is likely to be highest in states with low AFDC payments and high state SSI supplementation payments. Using difference-in-difference estimates based on state-level data on program participation and characteristics, we find that the increase in child SSI participation was significantly larger in low-AFDC states than in high-AFDC states. For SSI adults (a group unaffected by the *Zebley* decision), we find no effect of state AFDC payments on the increase in SSI participation over this period.

We use state-level data pre- and post-*Zebley* decision to obtain state fixed-effects estimates of the effects of the *Zebley* decision on SSI participation, AFDC participation, and total program participation. We find that *Zebley* increased SSI participation and total program participation by children. We find that *Zebley* increased child SSI participation more in states with lower AFDC payments and higher state SSI supplementation payments. These results suggest that families decide to participate in SSI on the basis of the net financial gain of SSI participation relative to AFDC participation. We attribute 43 percent of the *Zebley* increase in SSI to the SSI-AFDC benefit gap. We examine the effect of *Zebley* on the federal composition of child cash benefits. While the federal composition increased overall, it increased the least for states in the highest quintile of AFDC payments. We find that *Zebley* led to a decline in the employment rates of women with a high school education or less, and that this decrease was larger in states with higher AFDC payments.

Inflation Targeting: Lessons from Four Countries

Frederic S. Mishkin and Adam S. Posen

NBER Working Paper No. 6126
August 1997
JEL No. E5
Economic Fluctuations and Growth and Monetary Economics

In recent years, a number of central banks have announced numerical inflation targets as the basis for their monetary strategies. After outlining the reasons why such strategies might be adopted in the pursuit of price stability, this study examines the adoption, operational design, and experience of inflation targeting as a framework for monetary policy in the first three countries to undertake such strategies: New Zealand, Canada, and the United Kingdom. It also analyzes the operation of the long-standing German monetary targeting regime, which incorporated many of the same features as later inflation-targeting regimes. The key challenge for all of these monetary frameworks has been the appropriate balancing of transparency and flexibility in policymaking. This study finds that all of the targeting countries examined have maintained low rates of inflation and increased the transparency of monetary policymaking without harming the real economy through policy rigidity in the face of economic developments. A convergence of design choices on the part of targeting countries with regard to operational questions emerges from this comparative study, suggesting some lines of best practice for inflation-targeting frameworks.

Do Minimum Wages Fight Poverty?

David Neumark and William Wascher

NBER Working Paper No. 6127
August 1997
JEL Nos. J38, K3, J23
Labor Studies

The primary goal of a national minimum wage floor is to raise the incomes of poor or near-poor families with members in the workforce. However, estimates of employment effects of minimum wages tell us relatively little about whether they are likely to achieve this goal; even if the disemployment effects of minimum wages are modest, minimum wage increases could result in net income losses for poor families.

In this paper, we present evidence on the effects of minimum wages on family incomes from matched March CPS surveys, focusing in particular on the effectiveness of minimum wages in reducing poverty. The results indicate that over a one-to-two year period, minimum wages increase both the probability that poor families escape poverty and the probability that previously non-poor families fall into poverty. The estimated increase in the number of non-poor families that fall into poverty is larger than the estimated increase in the number of poor families that escape poverty, although this difference is not statistically significant. We also find that minimum wages tend to boost the incomes of poor families that remain below the poverty line.

The combined evidence indicates that in the wake of minimum wage increases, some families gain and others lose. On net, the various trade-offs created by increases in the minimum wage more closely resemble income redistribution among low-income families than income redistribution from high- to low-income families. Given these findings, it is difficult to make a distributional or equity argument for minimum wages.

Specification Analysis of Affine Term Structure Models

Qiang Dai and Kenneth J. Singleton

NBER Working Paper No. 6128
August 1997
Asset Pricing

This paper characterizes, interprets, and tests the over-identifying restrictions imposed in affine models of the term structure. Our analysis proceeds in three steps. First, we show that affine models can be categorized according to the different over-identifying restrictions they impose on δ, and the parameters of the diffusion matrices. Second, we show that this formulation is equivalent to a model in which there is a terraced drift structure with one of the state variables being the stochastic long-run mean of r. This equivalence allows direct comparisons of the substantive restrictions on the dynamics of interest rates imposed in CIR-style models and models in which the state variables are the stochastic long-run mean and volatility of r. Third, we compute simulated method-of-moments estimates of a three-factor affine term structure model, and test the over-identifying restrictions on the *joint distribution* of long- and short-term interest rates implied by extant affine models of r. We find that allowing for correlated factors is key to simultaneously describing the short and long ends of the yield curve. We interpret this finding in terms of the properties of the risk factors underlying term structure movements.

Measuring, Forecasting and Explaining Time Varying Liquidity in the Stock Market

Robert F. Engle and Joe Lange

NBER Working Paper No. 6129
August 1997
Asset Pricing

This paper proposes a new measure of market liquidity which directly measures the depth of the market: VNET. The measure is constructed from the excess volume of buys or sells during a market event defined by a price movement. Since this measure varies over time, it can be forecast and explained. Using TORQ data, we find that market depth varies positively but less than proportionally with past volume and negatively with the number of transactions. Both findings suggest that over time, high volumes are associated with an influx of informed traders and reduce market liquidity. High expected volatility as measured by the ACD model of Engle and Russell [1995] and wide spreads both reduce expected depth. If the asymmetric trades are transacted in shorter than expected times, the costs will be greater, giving an estimate of the value of patience.

Nonparametric Risk Management and Implied Risk Aversion

Yacine Aït-Sahalia and Andrew W. Lo

NBER Working Paper No. 6130
August 1997
JEL Nos. G12, G13, C14
Asset Pricing

Typical value-at-risk (VAR) calculations involve the probabilities of extreme dollar losses, based on the statistical distributions of market prices. Such quantities do not account for the fact that the same dollar loss can have two very different economic valuations, depending on business conditions. We propose a nonparametric VAR measure that incorporates economic valuation according to the state-price density associated with the underlying price processes. The state-price density yields VAR values that are adjusted for risk aversion, time preferences, and other variations in economic valuation. In the context of a representative agent equilibrium model, we construct an estimator of the risk-aversion coefficient that is implied by the joint observations on the cross-section of option prices and the time-series of underlying asset values.

Openness, Specialization, and Productivity Growth in Less Developed Countries

Diana Weinhold and James E. Rauch

NBER Working Paper No. 6131
August 1997
JEL Nos. F43, O40
International Trade and Investment

Many empirical studies have found a positive relationship between openness and growth in per capita GDP in less developed countries. Economists have produced many explanations for this correlation. However, the existing studies are consistent with *all* of these theories, and thus do not provide direct evidence in support of any one of them. Quah and Rauch show how increased openness to international trade can lead to increased specialization in models of endogenous growth through learning by doing. These models imply that increased specialization accelerates productivity growth by realizing dynamic economies of scale more fully. In order to test the hypothesis that specialization increases productivity growth in LDCs, we first define a Herfindahl index of production specialization for the manufacturing sector in 39 countries. We then present a series of dynamic panel regressions controlling for country fixed effects; these show that, for the less developed countries, the index of specialization is positively and significantly correlated with manufacturing productivity growth. We test the robustness of this correlation by including different variables that have been associated with growth in the regressions, such as openness, inflation, government spending, and investment.

Cohort Patterns in Canadian Earnings: Assessing the Role of Skill Premia in Inequality Trends

Paul Beaudry and David Green

NBER Working Paper No. 6132
August 1997
JEL No. J31
Labor Studies

This paper documents the pattern of change in age-earnings profiles across cohorts and evaluates its implications. Using synthetic cohorts from the Survey of Consumer Finances over the period 1971–93, we show that the age-earning profiles of Canadian men have been deteriorating for more recent cohorts as compared to older cohorts. We find this pattern for both high school- and university-educated workers. We find no evidence that the return to gaining experience has been increasing over time, nor do we find increased dispersion of earnings within cohorts. We view these findings as conflicting with the hypothesis that an increased skill-premium largely explains the observed increase in dispersion of male weekly earnings in Canada. When looking at the pattern for women, we find only minor differences in the age-earning relationships across cohorts.

Human Capital, Unemployment, and Relative Wages in a Global Economy

Donald R. Davis and Trevor A. Reeve

NBER Working Paper No. 6133
August 1997
JEL Nos. F1, E2, J2
International Trade and Investment

This paper develops a simple framework for examining human capital accumulation, unemployment, and relative wages in a global economy. It builds on the models of Davis [1997a, b] of trade between a flexible-wage America and a rigid-wage Europe. It adds to this a model of human capital accumulation based on Findlay and Kierzkowski [1983]. We examine a variety of comparative statics, including changes in educational capital and population, entry of new countries to the trading world, technical change, and a productivity slowdown. We derive the consequences for the skilled-to-unskilled wage gap, unemployment, and skill composition.

Social Security Programs and Retirement Around the World

Jonathan Gruber and David A. Wise

NBER Working Paper No. 6134
August 1997
Aging and Public Economics

The populations in all industrialized countries are aging rapidly and individual life expectancies are increasing. Yet older workers are leaving the labor force at younger and younger ages. In some countries, the labor force participation rates of 60-to-64-year-old men have fallen by 75 percent over the past three decades. This decline in labor force participation magnifies population trends, further increasing the number of retirees relative to the number of persons who are still working. Together these trends have put enormous pressure on the financial solvency of social security systems around the world. Ironically, the provisions of the social security systems themselves typically contribute to the withdrawal from the labor force.

This paper is a summary of the evidence on 11 industrialized countries. We distill the key conclusions from the collective findings of individual papers. Clearly there is a strong correspondence between the age at which benefits are available and departure from the labor force. Social security programs often provide generous retirement benefits at young ages. In addition, the provisions of these programs often imply large financial penalties on labor earnings beyond the social security early retirement age. Furthermore, in many countries, disability and unemployment programs effectively provide early retirement benefits before the official social security early retirement age. We conclude that social security program provisions indeed have contributed to the decline in the labor force participation of older persons, substantially reducing the potential productive capacity of the labor force. It seems evident that if the trend to early retirement is to be reversed, as almost surely will be dictated by demographic trends, then changing the provisions of social security programs that induce early retirement will play a key role.

Social Security and Retirement in The Netherlands

Arie Kapteyn and Klaas de Vos

NBER Working Paper No. 6135
August 1997
Aging and Public Economics

Compared to other industrialized countries, in the Netherlands the labor force participation of the elderly is very low. Moreover, it has fallen very fast over recent years. We discuss the incentives for employees to retire, arising from public schemes such as social security and disability insurance, and from private arrangements, such as early retirement and occupational pensions. In general, the generous replacement rates offered by these schemes act as powerful stimuli for retirement. Although Dutch research into the retirement effects of the earnings replacing schemes for the elderly was limited until the early 1990s, there is now a fast growing literature on this subject. This literature confirms the findings in our paper.

Social Security and Retirement in Spain

Michele Boldrin, Sergi Jimenez-Martin, and Franco Peracchi

NBER Working Paper No. 6136
August 1997
Aging and Public Economics

We describe the historical evolution and current organization of the Spanish Social Security (SS) system. We concentrate on the main public pension scheme for private employees in the manufacturing and service sector which covers the majority of Spanish workers. After describing the way in which pension and retirement decisions are regulated by this system, we try to compute the incentives to early retirement provided to different kinds of individuals. We show that the Spanish SS legislation generates strong incentives to retire early, and that Spanish workers tend to do so.

In particular, we find that pensions-induced incentives matter for the labor supply behavior of Spanish workers. While the Spanish system does not pay a particularly generous average pension relative to GDP per capita, it provides large minimum pensions to individuals with below average working histories and/or low wages. At the same time, the pension system provides workers who are earning average or above average salaries and have complete working histories with relatively weak financial gains from not retiring after the age of 60.

The combination of these features of the Spanish legislation seems to account well for the observed increase in the percentage of early retirees among Spanish pensioners during the 1990s.

Social Security, Occupational Pensions, and Retirement in Sweden

Mårten Palme and Ingemar Svensson

NBER Working Paper No. 6137
August 1997
Aging and Public Economics

This paper provides an overview of the Swedish social security system and its impact on individual retirement behavior. First we present some historical facts, as well as a more detailed description of the current situation, about the labor market behavior of older persons. Then we describe the social security system and the different occupational pension schemes, which have been of increasing importance. Finally, we discuss the results of a simulation in which we use the earnings paths of several representative workers to calculate the implicit tax (or subsidy) rate on additional work after age 55; the tax or subsidy is generated by the social security system in interaction with occupational pensions and income taxes, as well as housing allowances. We find that the observed labor market behavior of older men is in accordance with the economic incentives generated by the social security system, and in particular with the occupational pension scheme for blue collar workers.

Comparison Utility in a Growth Model

Christopher D. Carroll, Jody Overland, and David N. Weil

NBER Working Paper No. 6138
August 1997
JEL Nos. D91, E21, O40
Monetary Economics

This paper compares the dynamics of two general equilibrium models of endogenous growth in which agents have "comparison utility." In the "inward-looking" economy, individuals care about how their consumption in the current period compares to their consumption in the past (one way to describe this is "habit-formation" in consumption). In the "outward-looking" economy, individuals care about how their level of consumption compares with the consumption of others.

What if there is a negative shock to capital? In an endogenous growth model with standard preferences, there will be no effect on the saving rate or the growth rate of output. In both of the models that we consider, though, saving and growth will fall temporarily in response to the shock. The initial decline in saving and growth will be larger in the inward-looking case. However, since in the outward-looking case agents do not take into account the externality effect of their consumption, higher growth will lead to lower utility than in the inward-looking case.

Why Did the SSI Disabled Program Grow So Much? Disentangling the Effect of Medicaid

Aaron S. Yelowitz

NBER Working Paper No. 6139
August 1997
JEL Nos. H51, I18, I38
Health Care and Public Economics

The number of participants in the SSI program grew by 1.1 million from 1987 to 1993. This paper examines the role of Medicaid on the decision to participate in SSI. I use the rapid growth in average Medicaid expenditures as a proxy for their value. Ordinary-least-squares estimates of Medicaid's effect may be biased because of omitted variables bias and measurement error. Therefore, I apply two-stage least squares to estimate the effect of Medicaid, using average Medicaid expenditures for blind SSI recipients as an instrument. These estimates show that rising Medicaid expenditures significantly increased SSI participation among adults with low permanent incomes, explaining 20 percent of the growth.

Managed Care and the Growth of Medical Expenditures

David M. Cutler and Louise Sheiner

NBER Working Paper No. 6140
August 1997
Health Care and Public Economics

We use data across states to examine the relationship between HMO enrollment and medical spending. We find that increased managed care enrollment significantly reduces hospital cost growth. While some of this effect is offset by increased spending on physicians, generally we find a significant reduction in total spending as well. In analyzing the sources of hospital cost reductions, we find preliminary evidence that managed care has reduced the diffusion of medical technologies. States with high managed care enrollment were technology leaders in the early 1980s; by the early 1990s, those states were only average in their acquisition of new technologies. This finding suggests that managed care may have a significant effect on the long-run growth of medical spending.

What Drives Public Employment?

Dani Rodrik

NBER Working Paper No. 6141
August 1997
JEL Nos. H50, F40, O11
International Trade and Investment and Public Economics

Excessive levels of government employment are one of the most frequently made complaints about public-sector governance in developing economies. The explanation typically offered is that governments have used public-sector employment as a tool for generating and redistributing rents. This paper suggests an alternative hypothesis for government employment practices: relatively safe government jobs represent partial insurance against undiversifiable external risk faced by the domestic economy. By providing a larger number of "secure" jobs in the public sector, a government can counteract the income and consumption risk faced by the households in the economy. I show that countries that are greatly exposed to external risk have higher levels of government employment and have experienced faster rates of growth of government consumption. The basic finding on the (partial) correlation between government employment and exposure to external risk is robust against the alternative hypothesis, that government employment has been driven by considerations of rent-seeking and rent distribution.

Adapting to Circumstances: The Evolution of Work, School, and Living Arrangements Among North American Youth

David Card and Thomas Lemieux

NBER Working Paper No. 6142
August 1997
Labor Studies

We use comparable micro datasets for the United States and Canada to study the responses of young workers to the external labor market forces that have affected the two countries over the past 25 years. We find that young workers adjust to changes in labor market opportunities through a variety of mechanisms, including changes in living arrangements, changes in school enrollment, and changes in work effort. In particular, we find that poor labor market conditions in Canada explain why the fraction of youth living with their parents has increased in Canada relative to the United States recently. Paradoxically, this move back home also explains why the relative position of Canadian youth in the distribution of family income did not deteriorate as fast as in the United States.

The Objectives of the FDA's Office of Generic Drugs

Fiona Scott Morton

NBER Working Paper No. 6143
August 1997
JEL Nos. L51, L65
Industrial Organization

I use the variation in approval time for generic drugs to shed light on the objectives of the federal agency in charge of granting entry permission for these drugs: the FDA. Applications belonging to firms later found to have engaged in fraud or corruption were approved 9 months faster on average, controlling for other characteristics, than other applications. This indicates that illegal behavior was effective in reducing approval times. The FDA approved applications for large revenue markets faster; this is the only evidence that the agency is taking consumer surplus into account, but it is also consistent with a response to producer surplus and application quality. Order of entry into a drug market is not significant in predicting approval times because of the offsetting effects of social surplus and FDA learning. The FDA appears to avoid complaints from constituent firms by preserving the entry order of applications. FDA resources clearly affect approval times; this appears in the year effects after the generic scandal (much slower) and in the agency's use of slack provided by applications submitted before patent expiration. After the scandal, the FDA appears to care more about the risk inherent in a product and discounts a firm's prescandal technical experience. Overall, the results provide most support for an agency responding to bureaucratic preferences, complaints from constituent firms, and risk to consumers, rather than trying to maximize classic measures of social surplus (absent risk considerations).

Why the United States Led in Education: Lessons from Secondary School Expansion, 1910 to 1940

Claudia Goldin and Lawrence F. Katz

NBER Working Paper No. 6144
August 1997
JEL Nos. H4, I2, N3
Development of the American Economy and Labor Studies

The "second transformation" of U.S. education—the growth of secondary schooling—occurred swiftly in the early 1900s and placed the educational attainment of Americans far ahead of that in other nations for much of the twentieth century. Just 9 percent of U.S. youths had high school diplomas in 1910, but more than 50 percent did by 1940. By the mid-1950s the United States was 35 years ahead of the United Kingdom in the educational attainment of 14-to-17-year olds. What can explain the advance of secondary schooling in the United States, why differences in secondary schooling emerged across U.S. states and cities, and why America led the world in educational attainment for much of the twentieth century? Although we motivate the paper with international comparisons, the core of our analysis exploits the considerable cross-state, cross-city, and time-series variation within the United States.

The areas of the United States that led in secondary school education (the Far West, Great Plains, and parts of New England) were rich in income and wealth, had high proportions of elderly, and had relative equality of wealth or income. Given wealth, they also contained a low proportion of jobs in manufacturing and low percentages of immigrants and Catholics. Homogeneity of economic and social conditions, and the social stability of community, given a modicum of income or wealth, also fostered the extension of education to the secondary school level.

How Costly is Financial (not Economic) Distress? Evidence from Highly Leveraged Transactions that Became Distressed

Gregor Andrade and Steven N. Kaplan

NBER Working Paper No. 6145
August 1997
Corporate Finance

This paper studies 31 highly leveraged transactions (HLTs) of the 1980s that subsequently became financially distressed. At the time of distress, all the sample firms have operating margins that are positive and, in the majority of cases, greater than the median for the industry. Therefore, we consider these firms financially, not economically, distressed. The net effect of the HLT and financial distress is a slight increase in value: from pre-transaction to distress resolution, the sample firms experience a marginally positive change in (market- or industry-adjusted) value. This finding strongly suggests that, overall, the HLTs of the late 1980s succeeded in creating value. We also present quantitative and qualitative estimates of the (direct and indirect) costs of financial distress and their determinants. Our preferred estimates of the costs of financial distress are 10 percent of firm value. Our most conservative estimates do not exceed 23 percent of firm value. Operating margins of the distressed firms increase immediately after the HLT, decline when the firms become distressed and while they are distressed, but then rebound after the distress is resolved. Consistent with some costs of financial distress, we find evidence of unexpected cuts in capital expenditures, undesired asset sales, and costly managerial delay in restructuring. To the extent they occur, the costs of financial distress that we identify are concentrated heavily in the period after the firms become distressed, but before they enter Chapter 11.

Observations and Conjectures on the U.S. Employment Miracle

Alan B. Krueger and Jörn-Steffen Pischke

NBER Working Paper No. 6146
August 1997
JEL No. J23
Labor Studies

This paper has three goals. First, we place U.S. job growth in international perspective by exploring cross-country differences in employment and population growth. We find that the United States has managed to absorb added workers—especially female workers—into employment at a greater rate than most countries. The leading explanation for this phenomenon is that the U.S. labor market has flexible wages and employment practices, whereas European labor markets are rigid. The second goal of this paper is to evaluate the hypothesis of labor market rigidities. Although greater wage flexibility probably contributes to the comparative success of the United States in creating jobs for its population, the slow growth in employment in many European countries appears too uniform across skill groups to result from relative wage inflexibility alone. Furthermore, a great deal of labor market adjustment seems to take place at a constant real wage in the United States. This leads to the third goal: speculating on other explanations for why the United States has managed to absorb so many new entrants to the labor market successfully. We conjecture that product market constraints contribute to the slow growth of employment in many countries.

"Peso Problem" Explanations for Term Structure Anomalies

Geert Bekaert, Robert J. Hodrick, and David A. Marshall

NBER Working Paper No. 6147
August 1997
JEL Nos. G1, F3, E4, C5
Asset Pricing

We examine the empirical evidence on the expectations hypothesis of the term structure of interest rates in the United States, the United Kingdom, and Germany using the Campbell-Shiller [1991] regressions and a vector autoregressive methodology. We argue that anomalies in the U.S. term structure, documented by Campbell and Shiller [1991], may be attributable to a generalized peso problem in which a high-interest rate regime occurred less frequently in the sample of U.S. data than was anticipated rationally. We formalize this idea as a regime-switching model of short-term interest rates estimated with data from seven countries. Technically, this model extends recent research on regime-switching models with state-dependent transitions to a cross-sectional setting. Use of the small sample distributions generated by the regime-switching model for inference considerably weakens the evidence against the expectations hypothesis, but it remains somewhat implausible that our data-generating process produced the U.S. data. However, a model that combines moderate time-variation in term premiums with peso-problem effects is largely consistent with term structure data from the United States, United Kingdom, and Germany.

The Mix and Scale of Factors with Irreversibility and Fixed Costs of Investment

Andrew B. Abel and Janice C. Eberly

NBER Working Paper No. 6148
August 1997
JEL No. E22
Economic Fluctuations and Growth

When factors of production can be adjusted costlessly, the mix of factors can be considered separately from their scale. We examine factor choice and utilization when investment is irreversible and subject to a fixed cost, so that the capital stock is a quasi-fixed factor that is adjusted infrequently and by discrete amounts. We derive and analyze analytic approximations for optimal investment behavior, and show how the quasi-fixity of capital eliminates the dichotomy between factor mix and scale. We show that the quasi-fixity of capital can give rise to labor hoarding, even when labor is a purely flexible factor.

Transition to a Fully Funded Pension System: Five Economic Issues

Martin Feldstein

NBER Working Paper No. 6149
August 1997
JEL Nos. H55, E2
Aging, Economic Fluctuations and Growth, Health Care, and Public Economics

This paper provides a relatively nontechnical discussion of the effects of shifting from a pay-as-you-go system of Social Security pensions to a fully-funded plan based on individual accounts. The analysis discusses the rationale for such a shift and deals with five common problems: 1) the nature of the transition path; 2) the effect of the shift on national saving and capital accumulation; 3) the rate of return that such accounts would earn; 4) the risks of unfunded and funded systems; and 5) the distributional effects of the shift.

The Political Economy of the European Economic and Monetary Union: Political Sources of an Economic Liability

Martin Feldstein

NBER Working Paper No. 6150
August 1997
JEL Nos. F33, F02
Economic Fluctuations and Growth, International Finance and Macroeconomics, International Trade and Investment, Monetary Economics, and Public Economics

European Monetary Union (EMU) would be an economic liability. A single currency would cause at most small gains for trade and investment but would raise average cyclical unemployment and probably would raise inflation, perpetuate structural unemployment, and increase the risk of protectionism. EMU nevertheless is being pursued in order to create political union. Fundamental disagreements among member states about economic policies, foreign and military policies, and the sharing of political power are likely to create future intra-European conflicts. A united Europe would be a formidable participant in the 21st century's global balance of power, with uncertain consequences for world stability and peace.

Why Do Economists Disagree About Policy? The Roles of Beliefs About Parameters and Values

Victor R. Fuchs, Alan B. Krueger, and James M. Poterba

NBER Working Paper No. 6151
August 1997
JEL Nos. H00, J00, A1
Labor Studies and Public Economics

This paper reports the results of surveys of specialists in labor economics and public economics at 40 leading research universities in the United States. Respondents provided opinions of policy proposals; quantitative best estimates and 95 percent confidence intervals for economic parameters; answers to values questions regarding income redistribution, efficiency versus equity, and individual versus social responsibility; and their political party identification.

We find considerable disagreement among economists about policy proposals. Their positions on policy are related more closely to their values than to their estimates of relevant economic parameters or to their political party identification. Average best estimates of the economic parameters agree well with the ranges summarized in surveys of relevant literature, but the individual best estimates usually are widely dispersed. Moreover economists, like experts in many fields, appear more confident of their estimates than the substantial cross-respondent variation in estimates would warrant. Finally, although the confidence intervals in general appear to be too narrow, respondents whose best estimates are farther from the median tend to give wider confidence intervals for those estimates.

Evaluating Trade Reform Using Ex-Post Criteria

Jiandong Ju and Kala Krishna

NBER Working Paper No. 6152
September 1997
JEL Nos. F0, F1
International Trade and Investment

In contrast to existing work which takes an ex-ante approach and looks for policy prescriptions that improve welfare, this paper takes an ex-post approach. We ask whether indicators show that welfare has risen in the wake of a reform. That is, we look for evidence of welfare improvements in "outcome space." We derive necessary and sufficient conditions for welfare improving trade reform. These conditions are useful in evaluating Free Trade Areas and in reforming Article XXIV of GATT.

Social Security and Retirement in Germany

Axel Börsch-Supan and Reinhold Schnabel

NBER Working Paper No. 6153
September 1997
Aging and Public Economics

This paper describes the German public old age social security program and its incentive effects on retirement decisions. We present the key features of the system and express retirement incentives in the form of accrual rates of social security wealth and implicit tax rates on earnings. We summarize labor market behavior of older persons in Germany during the last 35 years and survey the empirical literature on the effects of the social security system on retirement in Germany.

We show that even after the 1992 reform, the German system is actuarially unfair. This generates a substantial redistribution from late- to early-retirees and creates incentives for early retirement. Indeed, average retirement age is very low in West Germany (about age 59) and even lower in East Germany. This tendency towards early retirement is particularly painful at times of population aging when the German social security contribution rate is expected to increase dramatically and will exceed the rates in other industrialized countries substantially.

Pensions and Retirement in the U.K.

Richard Blundell and Paul Johnson

NBER Working Paper No. 6154
September 1997
Aging and Public Economics

Labor force participation of men over the age of 50 fell dramatically in the United Kingdom between the early 1970s and early 1990s. Despite the fact that the state retirement pension does not become available to men until the age of 65, half of men aged 60–64 were economically inactive in the mid-1990s.

The main element of the state retirement pension is its flat rate, and for most people this is unaffected by any potential contributions made after age 60. Additional amounts of the earnings-related component are the result of extra contributions. Overall, the state retirement pension system offers no incentives for people to retire early.

However, other benefits are available to people before the age of 65. After reaching the age of 60, people face no availability-for-work test for the receipt of means-tested benefits, and there appears to be widespread use of invalidity-and-sickness benefits as a route into early retirement. Once these are accounted for, a substantial incentive for early withdrawal from the labor market is apparent. The combination of this with the reduced demand for, and wages available to, low skilled labor can help to explain the reduced labor force participation that is observed.

The state pension system, though, is complemented by extensive occupational pension coverage. For those in the occupational system, the rules of their own scheme are likely to be an important element in their retirement decision. We show that the retirement behavior of those with and without occupational pensions is substantially different. Those without are more likely to withdraw from the labor market very early. A large proportion of those with occupational pensions begin to retire from the age of 55 when relatively generous benefits are likely to become available. In many schemes there are significant incentives to retire before age 65.

Social Security and Retirement in Italy

Agar Brugiavini

NBER Working Paper No. 6155
September 1997
Aging and Public Economics

This paper analyzes the incentives provided by the Italian Social Security System (SS) to supply labor. Italy is an interesting example in this context because: 1) fertility rates are very low, while life expectancy has improved dramatically over the past decades; 2) the SS program is extremely generous to retirees by providing very high replacement rates; 3) virtually all retirement income is in the form of SS benefits; 4) the existence of an early retirement provision, which attracts no actuarial penalty, greatly distorts choices in favor of early retirement.

This paper addresses these issues by documenting the stylized facts of the labor market and the SS provisions. I then develop a simulation model to better understand the incentive effects of SS on current cohorts of retirees. This model proposes two measures for incentives: the accrual rate (that is, the percentage change in Social Security Wealth) from postponing retirement, and the implicit tax/subsidy (via SS entitlements) on potential earnings from working an additional year. The simulation results show that the Italian SS program provides a strong incentive to retire early; the age-implicit tax profile fits very closely with the estimated hazards out of the labor force. Additional evidence of the existence of behavioral responses to SS policy changes lends further support to the view that old age insurance arrangements have an influence on labor supply decisions.

Social Security and Retirement in Japan

Takashi Oshio and Naohiro Yashiro

NBER Working Paper No. 6156
September 1997
Aging and Public Economics

We discuss the effect of the incentive mechanism of the public pension on the retirement decisions made in the Japanese labor market. Although the labor market participation of Japanese older persons is quite high by international standards, one principle incentive mechanism of the public pension system in Japan that affects retirement behavior has many things in common with incentives in other OECD countries: pension benefits are designed to be "actuarially unfair," and the decision to work beyond age 60 is penalized. As the population quite rapidly ages, it is wasteful to maintain the disincentive mechanism that arises from the actuarially unfair pension scheme for older persons.

Inflation Forecasts and Monetary Policy

Ben S. Bernanke and Michael Woodford

NBER Working Paper No. 6157
September 1997
JEL Nos. E5, E52
Economic Fluctuations and Growth and Monetary Economics

Proposals for "inflation targeting" as a strategy for monetary policy leave open the important operational question of how to determine whether current policies are consistent with the long-run inflation target. An interesting possibility is that the central bank might target current private-sector *forecasts* of inflation, either made explicitly by professional forecasters or implicit in asset prices. We address the existence and uniqueness of rational expectations equilibriums when the central bank uses private-sector forecasts as a guide to policy actions. In a dynamic model that incorporates both sluggish price adjustment and shocks to aggregate demand and supply, we show that strict targeting of inflation forecasts typically is inconsistent with the existence of rational expectations equilibriums. Further, policies approximating strict inflation-forecast targeting are likely to have undesirable properties. We also show that economies with more general forecast-based policy rules are particularly susceptible to indeterminacy of rational expectations equilibriums. We conclude that, although private-sector forecasts may contain information useful to the central bank, ultimately the monetary authorities must rely on an explicit structural model of the economy to guide their policy decisions.

Optimal Risk Management Using Options

Dong-Hyun Ahn, Jacob Boudoukh, Matthew Richardson, and Robert F. Whitelaw

NBER Working Paper No. 6158
September 1997
JEL No. G13
Asset Pricing

This paper addresses the question of how an institution might optimally manage the market risk of a given exposure. We provide an analytical approach to optimal risk management under the assumption that the institution wishes to minimize its Value-at-Risk (VaR) using options, and that the underlying exposure follows a geometric Brownian. The optimal solution specifies the VaR-minimizing level of "moneyness" of the option as a function of the asset's distribution, the risk-free rate, and the VaR hedging period. We find that the optimal strike of the put is independent of the level of expense the institution is willing to incur for its hedging program. The costs associated with a suboptimal choice of exercise price, in terms of either the increased VaR for a fixed hedging cost or the increased cost to achieve a given VaR, are economically significant. Comparative static results show that the optimal strike price of these options is increasing in the asset's drift; decreasing in its volatility for most reasonable parameterizations, decreasing in the risk-free interest rate, nonmonotonic in the horizon of the hedge, and increasing in the level of protection desired by the institution (that is, the percentage of the distribution relevant for the VaR). We show that the most important determinant is the conditional distribution of the underlying asset exposure; therefore, the optimal exercise price is very sensitive to the relative magnitude of the drift and diffusion of this exposure.

Beyond Balanced Growth

Piyabha Kongsamut, Sergio Rebelo, and Danyang Xie

NBER Working Paper No. 6159
September 1997
JEL Nos. O14, O41
Economic Fluctuations and Growth

One of the most striking regularities of the growth process is the massive reallocation of labor from agriculture into industry and services. Balanced growth models commonly are used in macroeconomics because they are consistent with the well-known Kaldor facts about economic growth. However, these models are inconsistent with the dynamics of structural change that are a central feature of economic development. This paper discusses models with generalized balanced growth paths. These paths retain some of the key features of balanced growth but are consistent with the observed labor reallocation dynamics.

Effects of Air Quality Regulation on Decisions of Firms in Polluting Industries

Randy Becker and Vernon Henderson

NBER Working Paper No. 6160
September 1997
Productivity and Public Economics

This paper examines the unintended effects of air quality regulation on the decisions of major polluters, using plant data for 1963 to 1992. A key regulatory tool since 1978 is the annual designation of a county's air quality attainment status, where non-attainment status triggers specific requirements for equipment for new and existing plants. We find that, in the later years of regulation, non-attainment status reduces "expected births" in polluting industries by 40–50 percent. This results in a shift of polluting activity to cleaner, less populated attainment areas. Starting in the 1970s, the effects appear first for industries with larger plants and then, within industries, first for corporate plants relative to the much smaller non-affiliate, or single-plant, firm sector. In all industries, non-affiliates face less regulation than the bigger corporate plants, which results in a permanent shift away from corporate plant production in some industries. Older plants benefit from grandfathering provisions, greatly enhancing survival probabilities. Finally, the negotiation and permitting process under regulation appears to induce much greater up-front investments by new plants; thus, in non-attainment areas compared to attainment areas, regulation induces 50–100 percent increases in initial plant sizes. For plants over 10 years of age, though, there are no size differences.

Does Favorable Tax-Treatment of Housing Reduce Equipment Investment?

Ben Broadbent and Michael Kremer

NBER Working Paper No. 6161
September 1997
Economic Fluctuations and Growth and Public Economics

It is often argued that low tax rates on owner-occupied housing divert investment from equipment. This paper demonstrates that if people are heterogeneous in their propensity to save, and if there are constraints on borrowing, then favorable tax treatment of owner-occupied housing up to a certain value *increases* investment in equipment. This is because low taxes on housing encourage renters to become owner-occupiers, and this leads existing owner-occupiers to shift their portfolio of other assets from rental housing to equipment.

Is Real Exchange Rate Mean Reversion Caused By Arbitrage?

José M. Campa and Holger C. Wolf

NBER Working Paper No. 6162
September 1997
International Finance and Macroeconomics

The presence of purchasing power parity often is attributed to the exploitation of arbitrage opportunities in goods markets. We examine this presumption for a 1960–96 monthly panel of bilateral exchange rates and trade for the G-7 countries, and find strong mean reversion. However, despite allowing for substantial latitude in specification, we find very limited support for a simple view of arbitrage. The deviations of real exchange rates and trade from trend are virtually uncorrelated. Large trade deviations neither trigger nor accelerate mean reversion. Large real exchange rate deviations do not lead to systematic changes in trade. Constricting the sample to 18-month episodes of notable mean reversion —large persistent depreciations starting from overvalued levels—does not reveal any systematic relation either. However, the timing of these episodes does suggest an alternative explanation of mean reversion: the majority of episodes occur during periods of instability in the *nominal* exchange rate regime, pointing towards exchange rate policy or speculation as the immediate cause of mean reversion. Of course, both may reflect *expectations* of trade responses, opening an indirect role for *incipient arbitrage* in explaining mean reversion.

Economic Integration and Political Disintegration

Alberto Alesina, Enrico Spolaore, and Romain Wacziarg

NBER Working Paper No. 6163
September 1997
JEL Nos. F15, F43
Economic Fluctuations and Growth, International Finance and Macroeconomics, and International Trade and Investment

Trade liberalization and political separatism go hand in hand. In a world of trade restrictions, large countries enjoy economic benefits because political boundaries determine the size of the market. In a world of free trade and global markets, even relatively small cultural, linguistic, or ethnic groups can benefit from forming small and homogeneous political jurisdictions that trade peacefully and are integrated economically with others. This paper provides a formal model of the relationship between openness and the equilibrium number and size of countries, and successfully tests two implications of the model. The first is that the economic benefits of country size depend on and are mediated by the degree of openness to trade. The second is that the history of Nation-State creations and secessions is influenced by the trade regime.

Selection, Marketing, and Medicaid Managed Care

Sherry Glied, Jane Sisk, Sheila Gorman, and Michael Ganz

NBER Working Paper No. 6164
September 1997
JEL No. I11
Health Care

In several states, the Medicaid program allows beneficiaries to choose among multiple managed care plans and traditional Medicaid. We use data from a survey of New York City Medicaid beneficiaries enrolled in conventional Medicaid and in five Medicaid managed care plans to examine the effect of plan selection on measures of satisfaction with care, access to a regular source of care, and utilization of ambulatory and emergency room services. We use information on health status to evaluate selection on observable characteristics; variation in geographic patterns of enrollment to investigate selection on unobservable characteristics; and survey responses to questions about source of information about a plan to study selection responses to plan marketing.

We find that managed care enrollees differed from those who remained in traditional Medicaid on both observable and unobservable characteristics. Adjusting for population differences reduced the positive effect of managed care on satisfaction with care and eliminated the apparent utilization savings from managed care, but did not reduce the positive effect of managed care on access to regular care. Enrollees in different managed care plans did not differ substantially in terms of their observable health-related characteristics. However, they did differ on unobservable characteristics in ways that affected measures of satisfaction, access, and utilization.

We find that there are significant differences in the health-related characteristics of plan enrollees who learned about plans in different ways. Enrollees who learned about plans from plan representatives were healthier than those who learned about plans from city-income support staff. This suggests that marketing practices can contribute to selection. However, differences in marketing also had direct effects on patterns of use of health services that should be considered in making marketing policy decisions. Enrollees who learned about plans from plan representatives were more likely to report that they had a regular physician at their usual source of care, and they made fewer emergency room visits.

Mexico's 1994 Exchange Rate Crisis Interpreted in Light of the Non-Traded Model

Andrew M. Warner

NBER Working Paper No. 6165
September 1997
International Finance and Macroeconomics

This paper attempts to make the case that a two-sector model using the familiar traded/non-traded distinction offers a reasonably successful empirical explanation of why Mexico needed to devalue its exchange rate in 1994. This model provides a way to define and measure disequilibrium in the exchange rate, and thus may be useful in assessing the likelihood of an exchange rate crisis in other developing countries. The results suggest that Mexico's exchange rate was about 25 percent overvalued on the eve of its 1994 crisis, but was much closer to equilibrium by the end of 1996. I compare the approach in this paper with other ways of assessing disequilibrium in the exchange rate, based on purchasing power parity or monetary models of the exchange rate.

Implications of Skill-Biased Technological Change: International Evidence

Eli Berman, John Bound, and Stephen Machin

NBER Working Paper No. 6166
September 1997
JEL Nos. F1, J31, O3
International Trade and Investment, Labor Studies, and Productivity

Demand for less skilled workers decreased dramatically in the United States and in other developed countries over the past two decades. We argue that pervasive skill-biased technological change, rather than increased trade with the developing world, is the principal culprit. The pervasiveness of this technological change is important for two reasons. First, it is an immediate and testable implication of technological change. Second, under standard assumptions, the more pervasive the skill-biased technological change, the greater the increase in the embodied supply of less skilled workers and the greater the depressing effect on their relative wages through the prices of world goods. In contrast, in the Heckscher-Ohlin model with small open economies, the skill-bias of *local* technological change does not affect wages. Thus, pervasiveness deals with a major criticism of skill-biased technological change as a cause. Testing the implications of pervasive, skill-biased technological change, we find strong supporting evidence. First, *across* the OECD, most industries have *increased* the proportion of skilled workers employed *despite* rising or stable relative wages. Second, increases in demand for skills were concentrated in the *same* manufacturing industries in *different* developed countries.

The Transition in East Germany: When is a Ten Point Fall in the Gender Wage Gap Bad News?

Jennifer Hunt

NBER Working Paper No. 6167
September 1997
JEL Nos. J23, J31, J7, P5
Labor Studies

Since monetary union with western Germany on July 1, 1990, female monthly wages in eastern Germany have risen by 10 percentage points relative to male wages, but female employment has fallen 5 percentage points more than male employment. Using the German Socio-Economic Panel to study the years 1990–4, I show that along with age, the wage of a worker in 1990 is the most important determinant of the "hazard rate from employment." Differences in mean 1990 wages explain more than half of the gender gap in this hazard rate, since low earners were more likely to leave employment, and were disproportionately female. The withdrawal from employment of low earners can explain 40 percent of the rise in relative female wages. Competing-risks analysis reveals that the wage has its effect through layoffs, and hence through labor demand, which is consistent with the hypothesis that increases in the union wage have caused the least productive to be laid off. There is no evidence that reduction in the availability of child care is a major factor in reducing female employment rates.

What Happens When Countries Peg Their Exchange Rates? (The Real Side of Monetary Reforms)

Sergio Rebelo

NBER Working Paper No. 6168
September 1997
JEL No. F41
Economic Fluctuations and Growth and International Finance and Macroeconomics

There is a well-known set of empirical regularities that describes the experience of countries that peg their exchange rate as part of a macroeconomic adjustment program. Following the peg, economies tend to experience an increase in GDP, a large expansion of production in the non-tradable sector, a contraction in tradables production, a deterioration of the current account, an increase in the real wage, a reduction in unemployment, a sharp appreciation in the relative price of non-tradables, and a boom in the real estate market. This paper discusses how the changes in the expected behavior of fiscal policy that tend to be associated with the peg can contribute to explaining these facts.

Social Security and Retirement in Belgium

Pierre Pestieau and Jean-Philippe Stijns

NBER Working Paper No. 6169
September 1997
Aging and Public Economics

Belgium, like many other industrialized countries, is facing serious problems in financing its social security. The effects of aging are still to come, but Belgium already has one of the lowest rates of attachment to the labor force of older persons. This paper presents the key features of the Belgian social security system and focuses on labor force participation and receipt of benefits. Most of the attention is on the interaction between retirement behavior and the various social security schemes. By measuring the implicit tax/subsidy rate on work after age 55 through these schemes, we can explain the actual pattern of early and normal retirement of Belgian older workers.

Price Stability vs. Low Inflation in Germany: An Analysis of Costs and Benefits

Karl-Heinz Tödter and Gerhard Ziebarth

NBER Working Paper No. 6170
September 1997
Monetary Economics

We empirically investigate the costs and benefits of going from low inflation to price stability in Germany. Recent empirical evidence on the sacrifice ratio suggests that the break-even point at which the permanent benefits of reducing the trend rate of inflation by 2 percentage points exceed the temporary costs, in terms of output losses, is below 0.3 percent of GDP. We analyze the welfare implications of the interactions of even moderate rates of inflation with the distorting effects of the German tax system. We consider four areas of economic activity: intertemporal allocation of consumption; demand for owner-occupied housing; money demand; and government debt service. We estimate the direct welfare effects of reducing the rate of inflation, as well as the indirect tax revenue effects. We find that reducing the inflation rate by 2 percentage points permanently increases welfare by 1.4 percent of GDP. Finally, we consider the optimal rate of disinflation.

Pensions and the Distribution of Wealth

Kathleen McGarry and Andrew Davenport

NBER Working Paper No. 6171
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JEL Nos. J26, D31
Aging

Despite the enormous gains in the economic well-being of the elderly, and the progressivity of the Social Security benefit schedule, there remains substantial inequality in financial resources. We use data from the Health and Retirement Survey to examine the distribution of pension wealth in relation to other private wealth. We pay particular attention to differences by sex and race. We find that men are approximately 50 percent more likely to have pensions than are women and, conditional on having a pension, its mean value for men is twice as great as that for women. These differences remain significant even after we control for factors such as industry, occupation, and tenure. Differences by race are smaller than differences by sex but are still significant.

We find further that pension wealth is distributed slightly more evenly than is other private wealth. However, adding pension wealth to net worth has only small effects on overall inequality, and these effects are not distributed evenly across groups. Single women, in particular, fare worse when pension wealth is included as part of total wealth.

This paper also describes in detail the assumptions necessary to calculate pension wealth from the data available in the HRS. We hope this description will lead to a discussion of the most appropriate assumptions to be made in these calculations, and to a standard set of pension wealth variables.

The Main Bank System and Corporate Investment: An Empirical Reassessment

Fumio Hayashi

NBER Working Paper No. 6172
September 1997
JEL Nos. E22, G3
Economic Fluctuations and Growth

This paper examines whether the sensitivity of corporate investment to internal funds depends on the firm's access to a main bank. We use the sample of Japanese manufacturing firms constructed by Hayashi and Inoue [1991]. For either of two classifications of firms by their access to a main bank, there is no evidence that ties to a main bank mitigate the sensitivity of investment to the firm's liquidity. The large effect of main bank ties reported in Hoshi, Kashyap, and Scharfstein [1991] is most likely attributable to the relatively poor quality of their capital stock estimate.

Taxes, Organizational Form, and the Deadweight Loss of the Corporate Income Tax

Austan Goolsbee

NBER Working Paper No. 6173
September 1997
JEL Nos. H25, L22
Public Economics

By changing the relative gain to incorporation, corporate taxation can play an important role in a firm's choice of organizational form. General equilibrium models have shown that substantial shifting of organizational form in response to tax rates implies a large deadweight loss from taxation. I estimate the impact of taxes on organizational form using data from 1900–39. I find that the effect of taxes is significant but small. A corporate rate increase of .10 raises the noncorporate share of capital by .002 to .03. The implied deadweight loss of the corporate income tax is around 5–10 percent of revenue.

Real Exchange Rate Misalignments and Growth

Ofair Razin and Susan M. Collins

NBER Working Paper No. 6174
September 1997
International Finance and Macroeconomics

Real exchange rate (RER) misalignment is now a standard concept in international macroeconomic theory and policy. However, there is neither a consensus indicator of misalignment nor an agreed upon methodology for constructing such an indicator. We construct an indicator of RER misalignment for a large sample of developed and developing countries. This indicator is based on a well-structured but simple extension of an IS-LM model of an open economy. We then explore whether RER misalignments are related to country growth experiences. Interestingly, we find that there are important nonlinearities in the relationship. Only very high overvaluations appear to be associated with slower economic growth, while moderate to high (but not very high) undervaluations appear to be associated with more rapid economic growth.

Ethnicity and the Intergenerational Transmission of Welfare Dependency

George J. Borjas and Glenn T. Sueyoshi
NBER Working Paper No. 6175
September 1997
JEL No. I3
Labor Studies and Children

There are sizeable differences in the incidence and duration of welfare spells across ethnic groups, and these differences tend to persist across generations. Using the National Longitudinal Surveys of Youth, we find that children raised in welfare households are themselves more likely to become welfare recipients for longer durations. We also show that growing up in an ethnic environment characterized by welfare dependency has a significant effect on both the incidence and duration of welfare spells. About 80 percent of the difference in welfare participation rates between two ethnic groups in the parental generation is transmitted to the children.

To Ghetto or Not to Ghetto: Ethnicity and Residential Segregation

George J. Borjas
NBER Working Paper No. 6176
September 1997
JEL No. R12
Labor Studies

This paper analyzes the link between ethnicity and the choice of residing in ethnically segregated neighborhoods. Data drawn from the National Longitudinal Surveys of Youth show that there are strong human capital externalities both within and across ethnic groups. As a result, the segregation choices made by particular households depend both on the households' economic opportunities and on aggregate characteristics of the ethnic groups. The evidence suggests that highly skilled persons who belong to disadvantaged groups have lower probabilities of ethnic residential segregation, relative to the choices made by the most skilled persons in the most skilled groups.

Implicit Contracts and the Theory of the Firm

George Baker, Robert Gibbons, and Kevin J. Murphy
NBER Working Paper No. 6177
September 1997
Corporate Finance and Industrial Organization

We analyze the role of "implicit contracts" (that is, informal agreements supported by reputation rather than law) both within firms, as in employment relationships, and between firms, as for example hand-in-glove supplier relationships. We find that the optimal organizational form is determined largely by what implicit contracts it facilitates. We also show that vertical integration is an efficient response to widely varying supply prices. Finally, our model suggests why "management" (that is, the development and implementation of unwritten rules and codes of conduct) is essential in organizations.

Retirement Wealth Accumulation and Decumulation: New Developments and Outstanding Opportunities

Olivia S. Mitchell and James F. Moore
NBER Working Paper No. 6178
September 1997
JEL Nos. H55, O16, J26, G23
Aging and Labor Studies

Analysts have raised questions about the ability and inclination of current workers' to save enough for retirement. This issue is of obvious policy interest given the current debate over reforming national retirement income programs. We explore the implications of recent research on retirement wealth accumulation and decumulation for this debate. Our goal is to identify problems and opportunities in the area of preparedness for retirement.

Implied Exchange Rate Distributions: Evidence from OTC Option Markets

José M. Campa, P.H. Kevin Chang, and Robert L. Reider
NBER Working Paper No. 6179
September 1997
International Finance and Macroeconomics

This paper uses a rich new dataset of option prices on the dollar-mark, dollar-yen, and key EMS cross-rates to extract the entire risk-neutral probability density function (pdf) over horizons of one and three months. We compare three alternative smoothing methods—cubic splines; an implied binomial tree (trimmed and untrimmed); and a mixture of lognormals—for transforming option data into the pdf. Despite their methodological differences, the three approaches lead to a similar pdf which is clearly distinct from the lognormal benchmark, and typically is characterized by skewness and leptokurtosis.

We then document a striking positive correlation between skewness in these pdfs and the spot rate. The stronger a currency, the more expectations are skewed towards a further appreciation of that currency. We interpret this as a rejection of the suggestion that these exchange rates evolve as a martingale, or that they follow a credible target zone, either explicit or implicit. Instead, this positive correlation is consistent with target zones with endogenous realignment risk. We discuss two interpretations of our results on skewness: when a currency is stronger, the actual probability of further large appreciation is higher or, because of risk, such states are valued more.

Geographical and Sectoral Shocks in the U.S. Business Cycle

Atish R. Ghosh and Holger C. Wolf

NBER Working Paper No. 6180
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JEL Nos. E30, E32, E37
International Finance and Macroeconomics

We ask whether the aggregate U.S. business cycle is driven mainly by geographical shocks (affecting all sectors within a state) or by sectoral shocks (affecting the same sector in all states). We find that, at the level of an individual sector in an individual state, shocks to output growth are driven by the sector, not by the state: for example, textiles in Texas move more with textiles elsewhere in the United States than with other sectors in Texas. But shocks to sector growth rates exhibit a lower correlation *across* sectors as compared to the correlation of shocks to state growth rates *across* states. As a result, geographical shocks gain importance at higher levels of aggregation. Finally, we find that changes in the volatility of the aggregate U.S. business cycle reflect, to a roughly comparable degree, both changes in the *volatility* of state and sector business cycles, and changes in their *correlation* across sectors and states.

Revenue Neutral Trade Reform with Many Households, Quotas, and Tariffs

James E. Anderson

NBER Working Paper No. 6181
September 1997
JEL Nos. F13, H21
International Trade and Investment

Government budget balance forces the endogenous use of distortionary tax instruments when an exogenous reform is implemented. The aggregate efficiency of such a reform is based on comparisons of simple summary measures of the Marginal Cost of Funds of the various tariff or quota changes with the Marginal Cost of Funds of the alternative taxes, or of the Marginal Benefit of government supplied goods. The aggregate efficiency of tariff liberalization is dubious, while quota liberalization is more likely to be efficient. Social welfare rises with aggregate efficiency unless distribution effects are perverse. We provide plausible sufficient conditions for non-perverse distributional effects. The results frame a diagnostic method for sensitivity analysis in evaluations of trade and tax policies.

Is Price Inflation Different for the Elderly? An Empirical Analysis of Prescription Drugs

Ernst R. Berndt, Iain M. Cockburn, Douglas L. Cocks, Arnold Epstein, and Zvi Griliches

NBER Working Paper No. 6182
September 1997
JEL Nos. I11, C43
Aging, Health Care, and Productivity

Using annual data from 1990 to 1996, we empirically examine whether there are elderly-nonelderly price inflation differentials for one medical item, prescription pharmaceuticals. We assess prices for prescription drugs destined for ultimate use by the elderly versus the nonelderly at three points in the distribution chain: initial sales from manufacturers; intermediate purchases by retail pharmacies; and final sales from retail pharmacies to patients/payors.

We find that at the initial point in the distribution chain, there are no differences in price inflation for the aggregate of drugs destined for use by the elderly versus the nonelderly. At the intermediate sell-in to pharmacy distribution point, we examine antibiotics (ABs), antidepressants (ADs), and calcium channel blockers (CCBs). For ABs, elderly price inflation since 1992 is somewhat greater than for the young, reflecting in part the elderly's more intensive use of newer branded products having fewer side effects, adverse drug interactions, and more convenient dosing, attributes that are of particular importance to the elderly. For ADs, elderly price inflation is considerably less than for the young, in large part because of the elderly's greater use of older generic products. For CCBs, elderly-nonelderly differentials are negligible. None of these differentials adjust for variations in quality.

At the final retail sell-out point, we only examine ADs. We find that since retailers obtain larger gross margins on generic than on branded products, and because the elderly are disproportionately large users of generic ADs, the elderly-nonelderly price inflation differential benefiting the elderly at the intermediate point is reduced considerably at final sale.

Efficient Inflation Estimation

Michael F. Bryan, Stephen G. Cecchetti, and Rodney L. Wiggins II

NBER Working Paper No. 6183
September 1997
JEL No. E31
Monetary Economics

We investigate the use of trimmed means as high-frequency estimators of inflation. The known characteristics of price change distributions, specifically the observation that they generally exhibit high levels of kurtosis, imply that simple averages of price data are not likely to produce efficient estimates of inflation. Trimmed means produce superior estimates of "core inflation," which we define as a long-run centered moving average of CPI and PPI inflation. We find that trimming 9 percent from each tail of the CPI price-change distribution, or 45 percent from the tails of the PPI price-change distribution, yields an efficient estimator of core inflation for these two series, although lesser trims also produce substantial efficiency gains. Historically, the optimal trimmed estimators are found to be nearly 23 percent more efficient (in terms of root-mean-square error) than the standard mean CPI, and 45 percent more efficient than the mean PPI. Moreover, the efficient estimators are robust to sample period and to the definition of the presumed underlying long-run trend in inflation.

Procompetitive Market Access

Kala Krishna, Suddhasatwa Roy, and Marie Thursby

NBER Working Paper No. 6184
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JEL No. F13
International Trade and Investment

The view that U.S. businesses are being unfairly hurt by barriers to access in foreign markets has raised demands for market access requirements (MARs) from within U.S. industry and government. We show that, contrary to the prevailing wisdom of the recent literature, MARs can be implemented in a procompetitive manner: in a way that provides the right incentives for increasing aggregate output or lowering prices. We provide two examples to illustrate this point. We show that an implementation scheme in which the U.S. firm receives a pre-announced subsidy if the market share target is met leads to increased aggregate output. In a second example, we show that a MAR on an imported intermediate input can lead not only to increased imports of the intermediate good, but also to increased output in the final good market using the input. The intuition is that increasing output of the final good helps to make the MAR less binding, and this reduces the marginal cost of production in the final good market. Thus our results buttress the point made in Krishna, Roy, and Thursby [1997] that the effects of MARs depend crucially on the details of their implementation.

Household Portfolio Allocation Over the Life Cycle

James M. Poterba and Andrew A. Samwick

NBER Working Paper No. 6185
September 1997
JEL Nos. E21, G11
Aging

We analyze the relationship between age and portfolio structure for households in the United States. We focus on both the probability that households of different ages own particular portfolio assets and on the fraction of their net worth allocated to each asset category. We distinguish between age and cohort effects, using data from the repeated cross-sections of the Federal Reserve Board's Surveys of Consumer Finances. We conclude first, that there are important differences across asset classes in both the age-specific probabilities of asset ownership and in the portfolio shares of different assets at different ages. The data do not support the notion that all assets can be treated as identical when analyzing household wealth accumulation. Institutional factors, asset liquidity, and evolving investor tastes must be recognized in modeling asset demand. These factors could affect analyses of, as well as the composition of, overall household saving. Second, there are evident differences in the asset ownership probabilities of different birth cohorts. Currently, older households are more likely to hold corporate stock, and less likely to hold tax-exempt bonds, than younger households *at any given age.* These differences across cohorts are important to recognize when analyzing asset accumulation profiles.

Anonymous Market and Group Ties in International Trade

Alessandra Casella and James E. Rauch

NBER Working Paper No. 6186
September 1997
JEL No. F10
International Trade and Investment

For trade in differentiated products, preferential ties to a group that is settled abroad facilitate an exporter's entry into the foreign market by providing information and access to distribution channels. This contrasts with the difficulties of an unattached producer who is unfamiliar with the foreign environment. Inspired by the role of coethnic ties and business groups in East Asia, we build a simple general equilibrium model of trade that formalizes this observation. Output is generated through bilateral matching of agents of various types. Domestic matching is perfect: every trader knows the type of all others and can approach whomever he chooses. International matching is random: every trader lacks the information to choose his partner's type. However, group ties allow perfect matching abroad to a minority of individuals who have access to them and can decide whether or not to exploit them. We show that in the absence of ties, the existence of informational barriers reduces the volume of trade. By increasing trade, group ties are beneficial to the economy as a whole, but they have significant distributional effects. On average, group members benefit, but some may lose; nonmembers lose almost without exception, with the largest losses concentrated among those with the poorest domestic market niches.

Managed Care and Health Care Expenditures: Evidence From Medicare, 1990–1994

Laurence C. Baker and Sharmila Shankarkumar

NBER Working Paper No. 6187
September 1997
Health Care

Increases in the activity of managed care organizations are likely to have a number of implications for the structure and functioning of the U.S. health care market. One possibility is that there may be "spillover effects" influencing the performance of the entire health care delivery system, so that for both managed-care and nonmanaged-care patients, care is affected. Some discussions of Medicare reform have incorporated spillover effects as a way that increasing Medicare HMO enrollment could contribute to savings for Medicare.

We investigate the relationship between HMO market share and expenditures for the care of beneficiaries who are enrolled in traditional fee-for-service Medicare. We find that increases in system-wide HMO market share (which includes both Medicare and non-Medicare enrollment) are associated with declines in both Part A and Part B fee-for-service expenditures. The fact that managed care can influence expenditures for this population, which should be fairly well insulated from the direct effects of managed care, suggests that managed care can have broad effects on the entire health care market. Increases in Medicare HMO market share alone are associated with increases in Part A expenditures and with small decreases in Part B expenditures. This suggests that any spillovers directly associated with Medicare HMO enrollment are small.

For general discussions of health care policy, these results suggest that assessment of new policies that would influence managed care should account not only for the effects of managed care on enrollees, but also for its effects system-wide. For discussions of Medicare policy, these findings imply that previous results, which seemed to show the existence of large spillover effects associated with increases in Medicare HMO market share but did not adequately account for system-wide managed care activity and relied on older data, overstated the magnitude of actual Medicare spillovers.

Doing Without Money: Controlling Inflation in a Post-Monetary World

Michael Woodford

NBER Working Paper No. 6188
September 1997
JEL Nos. E31, E52
Economic Fluctuations and Growth and Monetary Economics

This paper shows that it is possible to analyze the determination of equilibrium inflation without any reference to either money supply or demand, as long as one specifies policy in terms of a "Wicksellian" interest-rate feedback rule. This approach should be of considerable interest, as central banks now generally agree that conventional monetary aggregates are of little use as targets or even indicators for monetary policy, because of the instability of money demand relations in economies with well-developed financial markets.

My central result is an approximation theorem showing the existence, for a simple monetary model, of a well-behaved "cashless limit" in which the money balances held to facilitate transactions become negligible. Inflation in the cashless limit is a function of the gap between the "natural rate" of interest, determined by the supply of goods and opportunities for intertemporal substitution, and a time-varying parameter of the interest-rate rule indicating the tightness of monetary policy. Inflation can be stabilized completely, in principle, by adjusting the policy parameter so as to track variation in the natural rate. Under such a regime, instability of money demand has little effect upon equilibrium inflation, and need not be monitored by the central bank.

Capital Income Taxation and Risk-Taking in a Small Open Economy

Patrick K. Asea and Stephen J. Turnovsky

NBER Working Paper No. 6189
September 1997
JEL Nos. E6, E62
International Finance and Macroeconomics and Public Economics

How do capital income taxes affect household portfolio choice and growth? We approach this question in the context of a stochastic model of a small open economy in which taxes on income from domestic capital (equity) and foreign bonds affect household portfolio choice, welfare, and the growth rate of the economy. Our theoretical and numerical analysis demonstrates the important role of risk in determining the mean and variability of growth, as well as the conditions under which a higher tax rate can improve welfare. To shed more light on the complex theoretical interaction between taxes and risk-taking, we estimate a reduced-form multinomial probit model of household portfolio choice using the method of simulated moments. The empirical evidence is in stark contrast to the conventional wisdom: we find that higher taxes make it less likely that the household will hold risky assets.

Entry Decisions in the Generic Pharmaceutical Industry

Fiona M. Scott Morton

NBER Working Paper No. 6190
September 1997
JEL Nos. L65, L20, L21
Industrial Organization

I use data on all generic drug approvals granted from 1984–94 to examine whether heterogeneity among potential generic entrants can be used to predict which firms will choose to enter a particular market. My findings suggest that a firm's portfolio characteristics, namely its previous experience with a drug or therapy, reduce the cost of preparing an ANDA and increase the probability of entry. The experience of a subsidiary's *parent* generally is not significant in predicting entry of the subsidiary. Firms also prefer entering markets that are similar, in terms of revenue and sales to hospitals, to markets already in their portfolios. On both scientific and marketing dimensions, the evidence shows that firms specialize.

I explore several different ways of constructing the set of potential entrants and find that the results are not affected by methodological variation. Standard IO theory suggests that profits per entrant will decline with the number of entrants. Previous research has found that generic prices depend on the number of generic entrants. The results presented here show that the total number of entrants increases with the size of the market (revenue). These findings imply that generic firms face a negative competition externality which makes their expectations about who else might be planning to enter any given market important in the entry decision. The limited evidence on entrant beliefs supports this conjecture, as do several features of a regulatory upheaval when firms begin entering different markets than they had in the past.

Juvenile Crime and Punishment

Steven D. Levitt

NBER Working Paper No. 6191
September 1997
JEL No. K42
Law and Economics and
Public Economics

Over the last two decades the punitiveness of the juvenile justice system has declined substantially relative to that of the adult courts. During that same time period, juvenile violent crime rates have grown almost twice as quickly as adult crime rates. This paper examines the degree to which those two empirical observations are related. I find that changes in relative punishments can account for 60 percent of the differential growth rates in juvenile and adult violent crime between 1978 and 1993. Juvenile offenders appear to be at least as responsive to criminal sanctions as adults. Moreover, sharp changes in criminal involvement with the transition from the juvenile to the adult court suggest that deterrence, rather than simply incapacitation, plays an important role. There does not, however, appear to be a strong relationship between the punitiveness of the juvenile justice system that a cohort faces and the extent of criminal involvement for that cohort later in life.

Investment Tax Incentives, Prices, and the Supply of Capital Goods

Austan Goolsbee

NBER Working Paper No. 6192
September 1997
JEL No. E62
Public Economics

Using data on the prices of capital goods, I show that much of the benefit of investment tax incentives does not go to investing firms but rather goes to suppliers of capital through higher prices. The reduction in the cost of capital from a 10 percent investment tax credit increases equipment prices by 3.5 percent to 7 percent. This lasts several years and is largest for assets with large order backlogs, low import competition, or with a large fraction of buyers able to use investment subsidies. Capital goods workers' wages rise, too. Instrumental variables estimates of the short-run supply elasticity are around one and can explain the traditionally small estimates of investment demand elasticities. In absolute value, the demand elasticity implied here exceeds one.

The Predictive Validity of Subjective Probabilities of Survival

Michael D. Hurd and Kathleen McGarry

NBER Working Paper No. 6193
September 1997
JEL Nos. I12, J14, D84
Aging

Although expectations (or subjective probability distributions) play a prominent role in models of decisionmaking under uncertainty, we have very little data on them, and instead are forced to base our models on unverifiable assumptions. Macroeconomic models often assume rational expectations, and microeconomic models base estimation on observable population probabilities. An alternative to these assumptions is querying individuals directly about their subjective probabilities, and using the responses as measures of expectations. Prior research on subjective survival probabilities in the Health and Retirement Study has shown that reported probabilities aggregate closely with life table values and covary appropriately with known risk factors. This paper uses panel data to study the evolution of subjective survival probabilities and their ability to predict actual mortality. We find that respondents modify their survival probabilities appropriately based on new information. The onset of a new disease or the death of a parent between the waves is associated with a reduction in survival probabilities. The subjective survival probabilities also predict actual survival. Those who survived in our panel reported probabilities approximately 50 percent greater at baseline than those who died. Although more needs to be learned about properties of subjective probabilities, we conclude that they have considerable promise for estimating models of decisionmaking under uncertainty.

Adverse Selection in Durable Goods Markets

Igal Hendel and Alessandro Lizzeri

NBER Working Paper No. 6194
September 1997
JEL Nos. D82, L15
Industrial Organization

An undesirable feature of Akerlof-style models of adverse selection is that ownership of used cars is independent of preferences, and is therefore *ad hoc*. We present a dynamic model that incorporates the market for new goods. Consumers self-select into buying new or used goods, making ownership of used goods endogenous. We show that, in contrast with Akerlof and in agreement with reality, the used market never shuts down. The volume of trade can be quite substantial, even in cases with severe informational asymmetries. By incorporating the market for new goods, the model lends itself to a study of the effects of adverse selection on manufacturers' incentives. We find that manufacturers may gain from adverse selection. We also give an example in which the market allocation under adverse selection is socially optimal. An extension of the model to a world with many brands that differ in reliability leads to testable predictions of the effects of adverse selection. We show that unreliable car brands have steeper price declines and lower volumes of trade.

Immigration and the Quality of Jobs

Daniel S. Hamermesh

NBER Working Paper No. 6195
September 1997
JEL Nos. J61, J23
Labor Studies

One precondition for the absence of labor-market competition between immigrants and natives is that they differ in their willingness to accept work that involves different amenities. The implications of a model embodying this assumption are that immigrants will experience inferior workplace amenities than natives, and that the presence of immigrants will affect the amenities that natives enjoy. I examine these possibilities with three sets of household data: the merged May and June 1991 Current Population Surveys (CPS), which include information on the timing of work over the day by nativity; the June 1991 CPS merged with industry data on workplace injury rates and durations; and the Quality of American Life Surveys of 1971 and 1978, which provide workers' responses about their satisfaction with particular aspects of their jobs. I show that (observationally) similar immigrants and native whites enjoy very similar packages of amenities: the precondition for noncompetition between immigrants and natives does not exist. Also, a greater concentration of immigrants has no consistent effect on the amenities that natives enjoy. African-Americans, however, receive inferior workplace amenities to those of otherwise similar native whites and immigrants.

Restraining the Leviathan: Property Tax Limitation in Massachusetts

David M. Cutler, Douglas W. Elmendorf, and Richard J. Zeckhauser

NBER Working Paper No. 6196
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Public Economics

Proposition 2½, a ballot initiative approved by Massachusetts voters in 1980, sharply reduced local property taxes and restricted their future growth. We examine the effects of Proposition 2½ on municipal finances and assess voter satisfaction with these effects. We find that Proposition 2½ had a smaller impact on local revenues and spending than expected; amendments to the law and a strong economy combined to boost both property tax revenue and state aid above forecasted amounts. Proposition 2½ did reduce local revenues substantially during the recession of the early 1990s. There were two reasons for voter discontent with the pre-Proposition 2½ financing system: agency losses from inability to monitor government were perceived to be high, and individuals viewed government as inefficient because their own tax burden was high. Through override votes, voters approved substantial amount of taxes above the tax limits imposed by the Proposition.

Optimal Management of Indexed and Nominal Debt

Robert J. Barro

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JEL Nos. H6, E6
Economic Fluctuations and Growth, Monetary Economics, and Public Economics

I use a tax-smoothing objective to assess the optimal composition of public debt with respect to maturity and contingencies. This objective motivates the government to make its debt payouts contingent on the levels of public outlay and the tax base. If these contingencies are present, but asset prices of noncontingent indexed debt are stochastic, then full tax smoothing dictates an optimal maturity structure of the noncontingent debt. If the certainty-equivalent outlays are the same for each period, then the government should guarantee equal real payouts in each period: that is, the debt takes the form of indexed consols. This structure insulates the government's budget constraint from unpredictable variations in the market prices of indexed bonds of various maturities. If contingent debt is precluded, then the government may want to depart from a consol maturity structure to exploit covariances among public outlay, the tax base, and the term structure of real interest rates. However, if moral hazard is the reason for the preclusion of contingent debt, then this consideration also deters exploitation of these covariances and tends to return the optimal solution to the consol maturity structure. The issue of nominal bonds may allow the government to exploit the covariances among public outlay, the tax base, and the rate of inflation. But if moral hazard explains the absence of contingent debt, then the same reasoning tends to make nominal debt issue undesirable. The bottom line is that an optimal-tax approach to public debt favors bonds that are indexed and long term.

Schooling Quality in a Cross Section of Countries

Jong-Wha Lee and Robert J. Barro

NBER Working Paper No. 6198
September 1997
JEL Nos. I21, J24
Public Economics

We investigate the determinants of educational quality in a panel dataset that includes output and input measures for a broad number of countries. The results show that family inputs and school resources are related closely to school outcomes, as measured by internationally comparable test scores, repetition rates, and dropout rates. Family characteristics, such as income and education of parents, have strong effects on student performance. Our findings also indicate that more school resources—especially smaller class sizes, but probably also higher teacher salaries and greater school length—enhance educational outcomes.

Environmental Taxes and the Double-Dividend Hypothesis: Did You Really Expect Something for Nothing?

Don Fullerton and Gilbert E. Metcalf

NBER Working Paper No. 6199
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JEL Nos. H2, Q2
Public Economics

The "double-dividend hypothesis" suggests that increased taxes on polluting activities can provide two kinds of benefits: first, an improvement in the environment; second, an improvement in economic efficiency from the use of environmental tax revenues to reduce other taxes, such as income taxes, that distort labor supply and saving decisions. In this paper, we make four main points. First, the validity of the double-dividend hypothesis logically cannot be settled as a general matter. Second, the focus on revenue in this literature is misplaced. Three policies have equivalent impacts on the environment and on labor supply. One of those policies raises revenue from the environmental component of the reform; another loses revenue; and a third has no revenue associated with it. Next, what matters is the creation of privately-held scarcity rents. Policies that raise product prices through some restriction on behavior may create scarcity rents. Unless those rents are captured by the government, such policies are less efficient at ameliorating an environmental problem than policies that do not create rents. Finally, we distinguish between two types of command and control regulations on the basis of whether they create scarcity rents.

Capital Income Taxes and the Benefit of Price Stability

Martin Feldstein

NBER Working Paper No. 6200
September 1997
JEL Nos. E3, E5, E6, H2
Economic Fluctuations and Growth, Monetary Economics, and Public Economics

Going from low inflation to price stability involves a short-term loss (associated with the higher unemployment rate required to reduce the inflation) and results in a series of welfare gains in all future years. The primary source of these gains is the reduction in the distortions that result from the interaction of tax rules and inflation. This paper quantifies the gains associated with reducing the distortion in favor of current consumption rather than future consumption, and in favor of the consumption of owner-occupied housing. These tax effects are much larger than the effect on the demand for money that is generally emphasized in studies of the distorting effect of inflation. The seignorage gains are also small in comparison to other effects of the tax-inflation interaction. My estimates imply that the annual value of the net benefits of going from 2 percent inflation to price stability are about 1 percent of GDP. Discounting this growing stream of benefits at a real discount rate of 5 percent implies a net present value of roughly more than 30 percent of GDP. All estimates of the short-run cost of going from low inflation to price stability are less than this.

Monetary Policy Regimes and Economic Performance: The Historical Record

Michael D. Bordo and Anna J. Schwartz

NBER Working Paper No. 6201
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JEL Nos. E42, E52
Monetary Economics

Monetary policy regimes encompass the constraints or limits imposed by custom, institutions, and nature on the ability of the monetary authorities to influence the evolution of macroeconomic aggregates. This paper surveys the historical experience of both international and domestic (national) aspects of monetary regimes from the nineteenth century to the present. First we survey the experience of four broad international monetary regimes: the classical gold standard, 1880–1914; the interwar period, in which a short lived restoration of the gold standard prevailed; the postwar Bretton Woods international monetary system, 1946–71, indirectly linked to gold; the recent managed float period, 1971–95. Then we present in some detail the institutional arrangements and policy actions of the Federal Reserve in the United States as an important example of a domestic policy regime. The survey of the Federal Reserve subdivides the demarcated broad international policy regimes into a number of episodes.

One salient theme in our survey is that the convertibility rule or principle that dominated both domestic and international aspects of the monetary regime before World War I has since declined in its relevance. At the same time, policymakers within major nations placed more emphasis on stabilizing the real economy. Policy techniques and doctrine that developed under the pre-World War I convertible regime proved to be inadequate for dealing with domestic stabilization goals in the interwar period, setting the stage for the Great Depression. In the post-World War II era, the complete abandonment of the convertibility principle, and its replacement by the goal of full employment, combined with the legacy of inadequate policy tools and theory from the interwar period, set the stage for the Great Inflation of the 1970s. The lessons from that experience have convinced monetary authorities to reemphasize the goal of low inflation, as it were, committing themselves to rule-like behavior.

Chinese Rural Industrial Productivity and Urban Spillovers

Yusheng Peng, Lynne G. Zucker, and Michael R. Darby

NBER Working Paper No. 6202
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JEL No. O10
Productivity

Rural industry in China has grown three times faster than China's GDP, surpassing agriculture by 1987, and now nearing half of the total Chinese economy. We use a rich, new county-level dataset to explore this dramatic growth. We find that a Cobb-Douglas production function explains more than 80 percent of the variation across counties in rural industrial output per capita in 1991. Idiosyncratic regional or provincial fixed effects play only a small role. There is a very large effect on productivity that comes from being near cities—(a county that is one standard deviation above average in its proximity to population centers) has 30 to 35 percent higher productivity because of the transfer of embodied technology from urban residents. We find strong support for the hypothesis that saving out of past agricultural income has provided start-up capital for rural enterprises. However, higher land-labor ratios lead to greater allocation of labor and capital to agriculture than to industry. Induced inflows of migrants reduce the effect on industrial labor, though. Proximity to cities and more education increase both capital and labor in rural industry. Provincial fixed effects, possibly reflecting local commercial and migration policies, have substantial explanatory power—one third or more—for industrial labor and capital.

Vertical Multinationals and Host-Country Characteristics

Kevin H. Zhang and James R. Markusen

NBER Working Paper No. 6203
September 1997
JEL Nos. F12, F23, O10
International Trade and Investment

The literature on multinationals and developing countries has examined the causality that runs from direct investment to changes in country characteristics (wages, productivity, skills, and the like) and the opposite direction of causality, from existing country characteristics to inward direct investment. This paper contributes to the latter line of research, inquiring into what country characteristics, particularly market size and labor-force composition, attract inward investment. This approach is motivated by the observation that the poorest countries attract a far smaller share of world direct investment than their share of income. Small markets receive less investment per capita than larger ones. We develop a model that generates both stylized facts in equilibrium, suggesting the existence of a development trap for small, skilled-labor-scarce countries.

Stronger Protection or Technological Revolution: What is Behind the Recent Surge in Patenting?

Samuel Kortum and Josh Lerner

NBER Working Paper No. 6204
September 1997
JEL Nos. O30, O32, O34
Productivity

We investigate the cause of an unprecedented surge in U.S. patenting over the past decade. Conventional wisdom points to the establishment of the Court of Appeals of the Federal Circuit by Congress in 1982. We examine whether this institutional change, which has benefitted patentholders, explains the burst in U.S. patenting. Using both international and domestic data on patent applications and awards, we conclude that the evidence is not favorable to the conventional view. Instead, it appears that the jump in patenting reflects an increase in U.S. innovation spurred by changes in the management of research.

Foreign Direct Investment and Employment: Home Country Experience in the United States and Sweden

Magnus Blomström, Gunnar Fors, and Robert E. Lipsey

NBER Working Paper No. 6205
October 1997
JEL Nos. F23, J23
International Trade and Investment

We compare the relationship between foreign affiliate production and parent employment in U.S. manufacturing multinationals to that in Swedish firms. U.S. multinationals appear to have allocated some of their more labor intensive operations, selling in world markets to affiliates in developing countries, reducing the labor intensity in their home production. Swedish multinationals produce relatively little in developing countries; most of that has been for sale within host countries with import-substituting trade regimes. The great majority of Swedish affiliate production is in high-income countries, the United States and Europe, and is associated with more employment, particularly blue-collar employment, in the parent companies. The small Swedish-owned production that does take place in developing countries also is associated with more white-collar employment at home. The effects on white-collar employment within the Swedish firms have grown smaller and weaker over time.

Trends in the Well-Being of American Women, 1970–1995

Francine D. Blau

NBER Working Paper No. 6206
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JEL Nos. J16, J31
Labor Studies

This paper examines the trends in the well-being of American women over the last 25 years, a time of significant changes in the relative economic status of women and in the labor market as a whole. I consider a broad range of indicators to capture changes in women's well-being in the family as well as in the labor market. For virtually all age and education groups, there is substantial evidence of rising gender equality in the labor market, notably in labor force participation, wages, and occupational distributions. There is also broad evidence of greater gender parity within married couple families, as the time doing housework of husbands has increased relative to that of wives, and the relative wages of wives rose when compared to their husbands' wages. However, parallel to the recent evidence of the declining labor market position of lower skilled men, there has been a similar deterioration in the economic status of less educated women, especially of high school dropouts. Their labor force participation rates and wages have risen at a much slower pace than those of more highly educated women, while their incidence of being single heads of households has increased much more rapidly. These findings for less educated women serve to underscore the widening gap between more and less skilled Americans of both sexes, as well as to emphasize its broad dimensions.

Where is the Market Going? Uncertain Facts and Novel Theories

John H. Cochrane

NBER Working Paper No. 6207
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JEL Nos. G12, E3
Asset Pricing and Economic Fluctuations and Growth

Will the stock market provide high returns in the future as it has in the past? The average U.S. stock return in the postwar period has been about 8 percent above Treasury bill rates. But that average is measured poorly: the standard confidence interval extends from 3 percent to 13 percent. Furthermore, expected returns are low at times like the present, with high prices. Therefore, the statistical evidence suggests a period of low average returns, followed by a slow reversion to a poorly measured long-term average.

I turn to a detailed survey of economic theory to see if models that summarize a vast amount of other information shed light on stock returns. Standard models predict nothing like the historical equity premium. After a decade of effort, a range of drastic modifications to the standard model can account for the historical equity premium. It remains to be seen whether the drastic modifications and a high equity premium, or the standard model and a low equity premium, will triumph in the end. Therefore, economic theory gives one reason to fear that average excess returns will not go back to 8 percent after the period of low returns signaled by today's high prices.

I conclude with a warning that low average returns do not imply that one should change one's portfolio. Someone has to hold the market portfolio; one should only deviate from that norm if one is different from everyone else.

NBER Historical Papers

Business Activity and the Boston Stock Market, 1835–1869

Jeremy Atack and Peter L. Rousseau

NBER Historical Paper No. 103
August 1997
JEL Nos. N21, N11, N61, G1
Development of the American Economy

This paper examines the performance of the Boston stock market, the nation's premier market for industrials, between 1835 and 1869. We develop new indexes of price performance, dividend yields, and total holding period returns for bank stocks and industrial equities, using annual data from Martin [1871]. Using these new series and a set of vector autoregression models, we conclude that disturbances in the banking sector, as manifested by declines in total stockholder returns, led to increases in short-term lending rates which in turn led to declines in the price performance of traded manufacturing firms. There is no evidence of feedback from manufacturing returns to bank stock prices via lending rates. These findings are consistent with a key role for banks in 19th century business fluctuations.

NBER Technical Papers

Measuring Predictability: Theory and Macroeconomic Applications

Francis X. Diebold and Lutz Kilian

NBER Technical Working Paper 213
August 1997
Economic Fluctuations and Growth

We propose a measure of predictability based on the ratio of the expected loss of a short-run forecast to the expected loss of a long-run forecast. This predictability measure can be tailored to the forecast horizons of interest, and it allows for general loss functions, univariate or multivariate information sets, and stationary or nonstationary data. We propose a simple estimator, and we suggest resampling methods for inference. We then provide several macroeconomic applications. First, based on fitted parametric models, we assess the predictability of a variety of macroeconomic series. Second, we analyze the internal propagation mechanism of a standard dynamic macroeconomic model by comparing predictability of model inputs and model outputs. Third, we use predictability as a metric for assessing the similarity of data simulated from the model and actual data. Finally, we sketch several promising directions for future research.

Moment Estimation with Attrition

John M. Abowd, Bruno Crépon, and Francis Kramarz

NBER Technical Working Paper No. 214
August 1997
JEL Nos. C13, C33, D21
Labor Studies

We present a method that accommodates missing data in longitudinal datasets of the type usually encountered in economic and social applications. The technique uses various extensions of "missing at random" assumptions that we customize for dynamic models. Our method, applicable to longitudinal data on persons or firms, is implemented using the Generalized Method of Moments with reweighting that appropriately corrects for the attrition bias caused by the missing data. We apply the method to the estimation of dynamic labor demand models. The results demonstrate that the correction is extremely important.

Evaluating Density Forecasts

Francis X. Diebold, Todd A. Gunther, and Anthony S. Tay

NBER Technical Working Paper No. 215
October 1997
JEL No. C5
Economic Fluctuations and Growth

We propose methods for evaluating density forecasts. We focus primarily on methods that are applicable regardless of the particular user's loss function. We illustrate the methods with a detailed simulation example, and then we present an application to density forecasting of daily stock market returns. We discuss extensions for improving suboptimal density forecasts, multi-step-ahead density forecast evaluation, multivariate density forecast evaluation, monitoring for structural change and its relationship to density forecasting, and density forecast evaluation with known loss function.

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