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## Program Report

### Productivity and Technical Change

Zvi Griliches and Ernst R. Berndt

In the two years since the last report in the Spring 1986 *NBER Reporter*, the research of the Productivity Program has expanded in two directions: the measurement of output and prices; and the structure of industries and their interaction with growth and productivity. We also have continued working on the relationship between R and D expenditures and productivity growth, and on the use of patent statistics as economic indicators.

Since productivity is measured as a ratio of output to input and since output measures often are derived by dividing a reported sales or value added by some relevant price index, the correct measurement of output and prices is central to the measurement and correct interpretation of productivity trends. Issues in the measurement of output, prices, and productivity always have been central to the NBER research tradition, going back to the early work of Simon Kuznets and the first set of Conferences on Research in Income and Wealth. Among the many contributions in the Bureau tradition was *The Price Statistics of the Federal Government* (the Stigler Report), initiated almost 30 years ago. One of its main recommendations, the use of regression methods to improve the measurement of prices for complex and changing commodities (hedonic price indexes), was implemented recently in the 1986 revision of the National Income Accounts with the introduction of a hedonic price index for computers.<sup>1</sup>

<sup>1</sup>Z. Griliches, "Hedonic Price Indexes for Automobiles: An Econometric Analysis of Quality Change," in *The Price Statistics of the Federal Government, NBER General Series No. 73, 1961*; R. Cole et al., "Quality Adjusted Prices for Computer Processors," *Survey of Current Business* 1 (1986); and Z. Griliches, "Hedonic Price Indexes and the Measurement of Capital and Productivity: Some Historical Reflections," *NBER Working Paper No. 2634, June 1988*.

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This issue of the *Reporter* highlights the Bureau's Productivity Program. Next, Richard B. Freeman describes his research on immigration, trade, and the labor market. Don Fullerton reports on his study of tax policy and productive investment. Alberto Giovannini assesses whether other countries could copy the European Monetary System and Benjamin M. Friedman discusses monetary aggregates and monetary policy. After the quarterly Economic Outlook Survey are biographical sketches, news of NBER conferences, the Conference Calendar, and other NBER news and reports. The *Reporter* concludes with short summaries of recent NBER Working Papers.

The widespread slowdown in the growth of productivity in the 1970s and 1980s has led to a renewed interest in output (and price) measurement. With the help of a grant from the Sloan Foundation, recently the NBER initiated a new program of research in this area, under the direction of Ernst R. Berndt and Zvi Griliches. We already have organized two workshops on "Prices and

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the Measurement of Output" in Cambridge, during July 1987 and July 1988. An important aspect of these workshops was the extensive participation by researchers from the Bureau of Economic Analysis and the Bureau of Labor Statistics, bringing together government researchers and academics to discuss common problems of significant practical importance. In collaboration with the Conference on Research in Income and Wealth, we are planning a major conference on "The Measurement of Output and Productivity in the Service Sector" to be held in Spring 1990. The last CRIW conference on this topic was organized more than 20 years ago by Victor R. Fuchs.<sup>2</sup>

As part of the abovementioned Sloan Foundation grant, Joshua Rosett of Princeton University and Donald Siegel of Columbia University have joined the NBER as post-doctoral fellows to work on this range of topics. A number of studies have been initiated or are in exploratory stages. We are collecting Census of Manufacturing data on selected purchases of services by manufacturing establishments at the four-digit SIC industries level, especially the purchase of communication and machinery repair services (and of computers), to see whether their "mismeasurement" (the use of incorrect deflators) leaves visible traces in the computed productivity numbers. We are reviewing the quality of the four-digit-level industry output measures, based in the Census and Annual Survey of Manufactures, which have been used widely by researchers at the NBER and elsewhere. Our preliminary findings indicate more problems from the incomparability of industries over time, and the differential sampling error in the ASM and the Census, than from the use of questionable deflators per se. We also are planning to look in greater detail ("audit") at the measurement of prices and output in several industries, such as construction and petroleum refining, and we are exploring the possibility of acquiring access to data on prices at the firm level, for selected firms and industries, to make possible a more detailed and consistent comparison of "true" micro data with their official aggregate reflection. In addition, we are updating the earlier work by Frank R. Lichtenberg and Griliches on the comparison of Census unit values and PPI-based price indexes by using the detailed six-digit-level 1982 Census of Production data.<sup>3</sup>

In parallel, Berndt has been exploring the construction of price indexes that account for quality changes over time. Working with Jeremy Cohen of IBM, Berndt has gathered data on the list prices and a variety of characteristics for over 1400 personal computer models introduced in the United States from 1975 to 1988. For a number of models since 1980, they also have collected data on the mail order discount prices. Using

<sup>2</sup>V. R. Fuchs, ed., *Production and Productivity in the Service Industries*, *NBER Studies in Income and Wealth* No. 34, 1969.

<sup>3</sup>F. R. Lichtenberg and Z. Griliches, "Errors in Price Deflators," *Journal of Business and Economic Statistics*, forthcoming.

hedonic regression analysis, they have constructed quality-adjusted price indexes for personal computers. Preliminary findings suggest that the quality-adjusted price indexes for personal computers have been declining even more rapidly than for mainframes, particularly since 1980, on the order of about 30 percent per year.<sup>4</sup> Berndt, Cohen, Griliches, and Amy Kim now are analyzing these data in further detail.

This range of empirically oriented studies of measurement issues has benefited from and interacted with the more broadly conceived ongoing theoretical and econometric work on productivity at the NBER. The measurement of multifactor productivity (MFP) growth, whether done by parametric or index number procedures, long has been anchored to the theory of cost and production, so that it is now commonplace to interpret MFP growth as outward shifts in production possibility frontiers, or downward shifts in the dual cost functions. Within that theoretical framework, it is well known that the traditional measure of MFP growth—growth in output minus growth in aggregate input, where aggregate input is a share-weighted sum of growth in individual inputs—rests on critical assumptions concerning returns to scale and on the speed with which inputs adjust to their long-run equilibrium levels. A major focus of the NBER researchers has been to examine implications of relaxing the traditional assumptions.

In a series of papers, Berndt and Melvyn A. Fuss, Charles R. Hulten, and Catherine J. Morrison have pointed out that when certain inputs are fixed in the short run, MFP measures correspond to shifts in production or cost frontiers, only if fixed weights are weighted by their shadow values rather than by their ex ante rental prices. Berndt-Fuss and Hulten addressed this issue in the nonparametric, index number tradition of MFP accounting, and also related the shadow value weights to measures of short-run capacity utilization. Morrison examined the shadow value weighting issue in the context of parametric models of cost and production, and extended the framework to permit non-constant returns to scale and nonstatic expectations of input prices and output demand.<sup>5</sup>

NBER researchers now are extending further and implementing empirically the basic insights from these three papers. Morrison, for example, is examining the

effect of regulations on MFP in the U.S. and Canadian steel and manufacturing industries, using a parametric approach to estimate shadow values, while she and Klaus Conrad use nonparametric procedures in their paper to examine the effects of regulation.<sup>6</sup> An alternative approach to modeling the effects of capacity utilization by using planned rather than actual output has been implemented for the U.S. and Canadian automobile industries by Leonard Waverman and Fuss; they use this framework to assess the effects of the U.S.-Canada free trade auto pact on costs and productivity growth.<sup>7</sup>

Yet another line of related research has focused on the welfare interpretations of MFP growth in the context of international trade, especially with changes in the terms of trade. W. Erwin Diewert and Morrison have developed a theoretical framework for assessing such changes and have implemented it empirically.<sup>8</sup>

A final strand of research in this tradition concerns the effects of cyclical variations on a firm's optimal markup behavior. Although the focus of this research is related only tangentially to the measurement of MFP growth, the analytical framework is very similar, and shadow values of the fixed inputs play an important role. Morrison has compared the optimal short-run markup behavior of manufacturing firms in the U.S. and Japanese manufacturing sectors using a framework in which labor and capital inputs are quasi-fixed; she finds that while markups are procyclical in the United States, they are slightly countercyclical in Japan.<sup>9</sup>

These various developments in the theory of MFP growth measurement have been surveyed recently by Diewert and Morrison.<sup>10</sup> Related research is ongoing. Berndt and Fuss, for example, are examining the notion and empirical implementability of measures of capacity utilization for multiproduct firms with multiple quasi-

<sup>4</sup>E. R. Berndt and J. Cohen, "Price and Quality Change in Microcomputers," paper presented at the 1988 NBER Summer Institute; and R. J. Gordon, "The Postwar Evolution of Computer Prices," NBER Working Paper No. 2227, April 1987.

<sup>5</sup>E. R. Berndt and M. A. Fuss, "Production Measurement with Adjustments for Variations in Capacity Utilization, and Other Forms of Temporary Equilibrium," *Journal of Econometrics* 33 (1986); C. R. Hulten, "Production Change, Capacity Utilization, and the Sources of Efficiency Growth," *Journal of Econometrics* 33 (1986); and C. J. Morrison, "Capacity Utilization and the Impacts of Pollution Abatement, Capital Regulation, and Energy Prices: A Comparison of the U.S. and Canadian Manufacturing Industries," in *Advances in Natural Resource Economics*, J. R. Moroney, ed. Greenwich, CT: Jai Press, 1987.

<sup>6</sup>K. Conrad and C. J. Morrison, "The Impact of Pollution Abatement Investment on Productivity Change: An Empirical Comparison of the United States, Germany, and Canada," NBER Working Paper No. 1763, November 1985; and C. J. Morrison, "Subequilibrium in the North American Steel Industries: A Study of Short-Run Biases from Regulation and Utilization Fluctuations," *Economic Journal* 98 (1988), and "Markups in U.S. and Japanese Manufacturing: A Short-Run Econometric Analysis," forthcoming as an NBER Working Paper.

<sup>7</sup>M. A. Fuss and L. Waverman, "The Canada-U.S. Auto Pact of 1965: An Experiment in Selective Trade Liberalization," NBER Working Paper No. 1953, June 1986.

<sup>8</sup>W. E. Diewert and C. J. Morrison, "Adjusting Output and Productivity Indexes for Changes in the Terms of Trade," NBER Reprint No. 937, November 1987, and in *Economic Journal* 96 (September 1986), pp. 659-679; and "Export Supply and Import Demand Functions," in *Empirical Methods for International Trade*, R. Feenstra, ed. Cambridge, MA: MIT Press, 1988.

<sup>9</sup>C. J. Morrison, "Productivity Measurement with Nonstatic Expectations and Varying Capacity Utilization: An Integrated Approach," *Journal of Econometrics* 33 (1986).

<sup>10</sup>W. E. Diewert and C. J. Morrison, "New Techniques in the Measurement of Multifactor Productivity," paper presented at the Spring 1987 Workshop of the NBER Productivity Group, Cambridge.

fixed inputs.<sup>11</sup> Also, joint research by Michael Denny, Berndt, and Diewert currently is examining procedures for measuring real input growth for purposes of international comparisons in the context of changing exchange rates and purchasing power parities.

Much of the growth in the economy and many changes in technology occur as part of the entry of new firms and the "death" or transmutation of older firms. As part of renewed interest in industrial structure and its interaction with economic growth, there also has been growing research interest at the NBER in the determinants of firm entry and exit. A conference on "Dynamic Aspects of Firm and Industry Behavior," organized by Timothy F. Bresnahan, Jonathan S. Leonard, and Ariel Pakes, was held in June 1988 in Cambridge. Richard Ericson and Pakes discussed the empirical implications of different models of firm growth and learning and presented evidence on this topic based on a large dataset for firms in Wisconsin.<sup>12</sup> Leonard analyzed survival probabilities as a function of firm size. Mark Schankerman investigated the interaction between investment behavior and macro shocks at the individual firm level. Peter C. Reiss looked at oil exploration as a paradigm for R and D models (since there are better output measures for the wildcatting business than for somewhat similarly motivated R and D investment). Bresnahan and Reiss assessed firm entry into small isolated markets, using their data to test different oligopoly theories. In related work, Bronwyn H. Hall has studied the determinants of firm growth and the influence of R and D expenditures on the probability of a merger or takeover.<sup>13</sup> More generally, we are planning to extend our studies into the overlapping area of firm behavior, technological change, and industrial structure.

In our studies of patenting, R and D, and productivity, we are reaching closure in certain areas and opening up some new lines of research. A review and summary of our earlier work has been published recently and Griliches is currently writing a more general survey paper on this field.<sup>14</sup>

We recently have acquired some of the data collected at Yale on the relative usefulness of patents in appropriating returns from innovation and have merged them with the NBER R and D panel dataset. A prelimi-

nary analysis of these data by Iain Cockburn and Griliches has indicated that the stock market values unanticipated movements in R and D more highly in industries in which patent protection is effective than in industries in which it is not.

An analysis of other measures of "appropriability" of innovation returns showed much less relevant interindustry variation in them than in the responses to the patent questions. Work is continuing on this topic and on utilizing the science "connectedness" questions in the Yale Survey in explaining differences in productivity across industries.<sup>15</sup>

Another effort to improve upon the use of simple patent counts as measures of inventive activity has been pursued by Manuel Trajtenberg in his analysis of technical change in and welfare gains from the development of CAT (computerized axial tomography) scanners. Using citation-weighted patent counts yields a much closer fitting index to his welfare change measures than does a similar unweighted index.<sup>16</sup>

In a related vein, Adam Jaffe is pursuing the measurement of spillover effects from university-based academic research using detailed patent data by industry and state.<sup>17</sup> Additional work on using patent renewal data to derive "quality" measures for them is continuing. Progress reports on this work were presented at the 1988 Summer Institute by Schankerman on French data, John Putnam on British data, and Margaret Simpson on Scandinavian data.

Finally, an effort to integrate and understand the results of the work on R and D, patents, and the stock market rate of return in light of the rather high estimates of the variance in the individual value of patent rights that has emerged from the work on patent renewals, was made by Griliches, Hall, and Pakes.<sup>18</sup> They conclude that this variability, and the rather high variability in the stock market returns themselves, mask what indeed may be rather interesting relationships between such variables. Patent statistics can be a very useful indicator of inventive output in many but not all contexts.

This brief survey cannot do justice to all of the work done by the members of the productivity studies group. Mention should be made, however, of the work on R

<sup>11</sup>E. R. Berndt and M. A. Fuss, "Productivity Measurement and Capacity Utilization in the Context of Multiple Outputs and Multiple Quasi-Fixed Inputs," paper presented at the 1987 Annual Meeting of the American Economic Association, New York.

<sup>12</sup>A. Pakes and R. Ericson, "Empirical Implications of Alternative Models of Firm Dynamics," University of Wisconsin, Social Systems Research Institute Workshop Series Paper 8803, 1987.

<sup>13</sup>B. H. Hall, "The Effect of Takeover Activity on Corporate Research and Development," NBER Working Paper No. 2191, March 1987.

<sup>14</sup>Z. Griliches, A. Pakes, and B. H. Hall, "The Value of Patents as Indicators of Inventive Activity," NBER Working Paper No. 2083, November 1986, and in *Economic Policy and Technical Performance*, P. Dasgupta and P. Stoneman, eds. Cambridge, England: Cambridge University Press, 1986.

<sup>15</sup>I. Cockburn and Z. Griliches, "Industry Effects and Appropriability Measures in the Stock Market's Valuation of R and D and Patents," NBER Working Paper No. 2465, December 1987, and *American Economic Review* (May 1988); and R. C. Levin et al., "Appropriating the Returns from Industrial Research and Development," *Brookings Papers in Economics* 3 (1987).

<sup>16</sup>M. Trajtenberg, "Patents, Citations, and Innovations: Tracing the Links," NBER Working Paper No. 2457, December 1987.

<sup>17</sup>A. Jaffe, "Real Effects of Academic Research," paper presented at the 1988 NBER Summer Institute.

<sup>18</sup>Z. Griliches, B. H. Hall, and A. Pakes, "R and D, Patents, and Market Value Revisited: Is There a Second (Technological Opportunity) Factor?" NBER Working Paper No. 2624, June 1988.

and D spillovers by Jeffrey I. Bernstein and M. Ishaq Nadiri; by Hulten, James W. Robertson, and Frank C. Wykoff on depreciation, energy obsolescence, and the productivity slowdown; by Jacques Mairesse and Griliches on the heterogeneity in estimated production function coefficients at the individual firm level; and the work by Nancy L. Rose and Paul L. Joskow on the diffusion of new technologies in the electric utilities industry.<sup>19</sup>

<sup>19</sup>J. I. Bernstein and M. Ishaq Nadiri, "Research and Development and Intraindustry Spillovers: An Empirical Application of Dynamic Duality," NBER Working Paper No. 2002, August 1986, and "Interindustry R and D Spillovers, Rates of Return, and Production in High Tech Industries," NBER Working Paper No. 2554, April 1988; C. R. Hulten, J. W. Robertson, and F. C. Wykoff, "Energy, Obsolescence, and the Productivity Slowdown," NBER Working Paper No. 2404, October 1987; J. Mairesse and Z. Griliches, "Heterogeneity in Panel Data: Are There Stable Production Functions?" NBER Working Paper No. 2619, June 1988; and N. L. Rose and P. L. Joskow, "The Diffusion of New Technologies: Evidence from the Electric Utility Industry," NBER Working Paper No. 2676, August 1988.

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## Research Summaries

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The following four articles summarize presentations made at NBER's Annual Research Conference in New York on October 17.

### Annual Research Conference—I: Immigration, Trade, and the Labor Market\*

Richard B. Freeman

During the 1970s and 1980s, flows of foreign workers and foreign goods into the United States increased sharply, as both immigration and foreign trade became increasingly important in the American labor market. The number of legal and illegal immigrants to the United States increased, particularly in selected

\*An NBER Summary Report by the same title may be ordered by name from: NBER, 1050 Massachusetts Avenue, Cambridge, MA 02138. An NBER conference volume on "Immigration, Trade, and the Labor Market" is forthcoming from the University of Chicago Press.

gateway cities such as Miami, Los Angeles, and New York, while the national origins of immigrants changed from primarily European to Mexican, Latin American, and Asian. The role of foreign trade in the economy—measured by the ratio of imports plus exports to GNP—doubled, and the massive trade deficit of the 1980s turned the United States into a debtor country. An increasing proportion of American workers came to be employed in foreign-owned enterprises.

Motivated by these developments, the NBER undertook a three-pronged research project on the internationalization of the labor market. First, we studied the factors that influence the number and characteristics of immigrants and their location in the United States. Second, we examined how immigration and trade had affected the wages and employment of American workers. Third, we compared the impact of immigration and trade on Australian and Canadian labor markets with their impact on the U.S. labor market.

### Findings

We found that the flow of illegal aliens to the United States, while sizable, is far less than the numbers often quoted in the news media. Based on the number of deaths of and births to Mexican-born persons in the United States and the number of illegal aliens apprehended at the border, we estimate that there were around 2 million illegal aliens in the country in the United States in 1980, roughly half the number enumerated in the U.S. Census of Population.

We also learned that the characteristics of immigrants who come to the United States are influenced significantly by the economic and political situation in their home country. Immigrants from countries with an egalitarian wage structure are likely to have higher earnings capacity than those from countries with an unequal wage distribution. The 1965 changes in U.S. immigration policy produced a wave of immigrants whose education and market skills were lower relative to natives than was true of previous immigration waves. Changes in Canadian immigration laws produced a similar pattern in the late 1970s, while Australia, by contrast, attracted immigrants who did well relative to natives through 1980.

New immigrants to the United States seem to cluster in a small number of cities and show no evidence of dispersing over the country as they stay in the United States. As a result, any immediate adverse effects on the economic opportunities of natives are likely to occur in those few cities. Yet, we find that while increased immigration has a modest adverse impact on the wages of new and older waves of immigrants, it has little effect on natives, including young blacks and Hispanic Americans, who tend to be possible close substitutes for immigrants in the labor market.

Our project showed that wages in industries whose sales were adversely impacted by trade tended to decline relative to wages in other industries; this seems

## **Tax Policy and Productive Investment**

Don Fullerton

to buffer somewhat the loss of jobs resulting from a surge of imports. Unionized sectors adjust wages more than nonunion sectors, apparently because workers in unionized industries earn above-market wages that can be reduced to save jobs, while the wages of non-union workers are closer to competitive levels. Further, workers dislocated by trade tend to have greater problems finding work than workers dislocated for other reasons.

We observed that immigrants tend to work in import-competing industries. In the United States, this means that they are in relatively low- and declining-wage jobs. By contrast in Australia—where union/nonunion wage differentials are less, unionization is more significant, and trade policies protect sectors that employ immigrants—low-skill immigrants earn relatively higher wages than in the United States. The nature of labor market institutions and trade policy thus affect the economic well-being of immigrants in the two settings.

As a broad generalization, the NBER project concluded that the American labor market adjusted well to immigrant flows, absorbing immigrants into local labor markets with little loss to native workers. On the other hand, the United States had greater difficulty adjusting to the surge of imports, which produced noticeable losses to natives in affected industries.

Several factors appear to underlie this difference in the adjustment to immigration versus trade. First are the differences in the concentration and magnitude of imports and immigration. In the ten industries with the largest growth of imports relative to sales, the share of imports rose from 14 percent of sales to 73 percent of sales between the 1960s and 1980s. By contrast, in the ten Standard Metropolitan Statistical Areas with the greatest 1970–80 growth of immigrants relative to the work force, new immigrants averaged 20 percent of the 1980 work force.

Second, immigration has offsetting effects on the demand for labor in local areas, because immigrants buy locally produced goods and services. In contrast, even with balanced trade, workers in an industry facing a surge of imports will not benefit from offsetting export-created demand for labor.

Third, it is possible that labor supply in gateway cities did not rise as much as immigration numbers suggest, because native migrants were deterred from moving to those areas.

Fourth, at least in some industries, workers' skills are likely to be industry-specific, making mobility more costly across industry lines than across geographic areas. All of these considerations may explain why the 1980s surge in imports caused a greater shock in the labor market than the influx of immigrants did. While trade and immigration may have the same long-run effects on the economy, they have quite different impacts at current levels on directly affected workers. Trade upset balances of supply and demand in industry labor markets more than immigration upset those balances in local labor markets.

The extensive debate over the Tax Reform Act of 1986 (TRA) involved the relative productivity of such tangible assets as equipment, structures, inventories, and land, but there was little discussion of intangible assets, such as patents, trademarks, copyrights, and the reputation of the firm. The 1986 Act in part presumed that tax policy should not interfere with firms' investment decisions. That is, if profits reflect all of the returns to an asset, then competitive firms on a "level playing field" will make the appropriate investment without any tax incentive to do so.

Unfortunately, though, TRA did not make the playing field level. While it repealed the investment tax credit (ITC), which was a special tax break for equipment, it did not alter the immediate expensing of advertising, a major tax break for intangible capital.

On the other hand, the playing field is not necessarily supposed to be level. Research and development (R and D), for example, is a form of intangible capital that may have benefits to society that are not reflected in the profits of the firm.

Finally, the playing field never can be level under an income tax: many large expenses of the firm, beyond R and D and advertising, lead to future profits but are not easily identified and measured for tax purposes.

### **The Playing Field Was Not Made Level**

Under prior law, the ITC provided an incentive to invest in equipment rather than in other assets. If equipment were productive to society in a way that was not reflected in the profits of the firm, this special incentive might have been justified. However, no study has shown such a "positive externality" for equipment. Therefore, the repeal of the ITC was believed to level the playing field, improve the allocation of resources, and make total investment more productive.

TRA indeed may have leveled the playing field for tangible assets, such as equipment, structures, land, and inventories. However, the tax code still favors intangible assets, such as patents, customer goodwill, and general firm know-how. When a firm invests in intangibles such as advertising and R and D, it receives a very powerful tax incentive: it can deduct a cost of the investment immediately, rather than taking delayed depreciation. The incentive provided by such expensing is even greater than the incentive of an ITC.

If there is much intangible capital in the economy, then a level playing field between equipment and other intangibles is not as important as a level playing field

between tangible and intangible assets. Thus, the repeal of the ITC actually may have made total investment *less* productive.\*

However, TRA did not just repeal the ITC. It also lowered the corporate tax rate, which helped to reduce the tax difference between tangible and intangible capital.

### **The Playing Field Is Not Supposed to Be Level**

Because of the positive externalities associated with R and D, using tax policy to encourage R and D can increase the value of national output. The incremental R and D tax credit provides some incentive, but the immediate deduction of all R and D costs is an even more powerful incentive. Together these incentives may or may not be enough to reflect the spillover benefits of R and D to the rest of the economy.

The case of advertising is quite different. Advertising certainly can contain valuable information, but its benefits generally are limited to the firm and its customers. If the benefits of advertising are captured by the firm, then there is no productivity justification for special advantages, such as the expensing of advertising investments.

Moreover, advertising can be wasteful or can erect harmful entry barriers. For example, Coke and Pepsi may reap profits from their advertising wars, but the total benefit to society may be *less* than the firms' private benefits. If so, there may be a productivity justification for an extra tax, or a disincentive, on advertising relative to other forms of investment. Limiting deductions for advertising would injure big advertisers, but it might increase production efficiency and raise tax revenues.

Implementing this idea might require a complicated system to distinguish the short-term benefits of advertising from its long-term benefits, or to separate informative advertising from other types that are used simply to compete for market share. However, even a very rough system would reflect the productivity of investments in advertising more accurately than the current system does.

### **The Playing Field Never Will Be Level**

One way to measure the amount of intangible capital in the economy is the "perpetual inventory method," looking at investment over time and making certain assumptions about depreciation. Andrew B. Lyon and I assume that each year's R and D expenditure is added to the stock of knowledge, and that 15 percent of the stock is subtracted for depreciation. Under these assumptions, there was \$305 billion worth of R and D capital in the United States by 1983. However, unlike R

and D, much advertising is useful only briefly. Therefore we assume that one-third of advertising depreciates each year. With that assumption, there was \$165 billion of advertising capital by 1983. Together, these figures comprise 11 percent of the total capital stock.

However, intangible capital also includes any knowledge or information that is of value to the firm, such as the firm's reputation, customer relations, and production expertise. Firms invest in these assets by many different routes, including employee recruitment and training, which are current expenditures undertaken for the sake of future profitability; other current costs accepted by the firm in order to establish goodwill with employees and unions; the costs of making customer lists or of having sales representatives for the sake of customer relations; and the cost of a consultant to design an advertising campaign, properly deducted as a business expense rather than as advertising. None of these investments is included in the measures of intangible capital that we use.

Moreover, firms build a reputation by making a good product and standing behind it. For example, the firm may take losses on a new product while customers gain confidence and the market is established. When the customer service department accepts the expense of taking back faulty merchandise, it is not for the sake of the current sale but for the sake of future sales. All of these expenditures are investments in intangible capital and are expensed for tax purposes.

Thus, the estimates for advertising and R and D capital may understate the total amount of intangible capital grossly. Given the extent to which the stock market value of firms exceeds the measured value of tangible capital, the true stock of intangible capital may be four or five times our estimates, or about one-third of the total capital stock. This indeed would be enough to reverse some views about the importance of a level playing field and about the relative taxation of different assets.

Tax policy never will be able to identify and curtail deductions for all of the ways that firms invest in their reputation. As long as there exists more tangible than intangible capital, productive efficiency still is increased by removing the tax break for advertising and other investments that can be identified. Rather than set up depreciation schedules, an immediate deduction for only 80 or 90 percent of advertising would be much simpler and would have the same effect.

In summary, a special tax break can be justified by external benefits to the economy in excess of the private benefits to the firm. Since tangible equipment was not shown to have significant external benefits, the removal of its special incentive was a major goal of TRA. Repeal of the ITC raised significant revenue that was used to reduce the corporate tax rate, thus partially leveling the playing field between tangible and intangible assets. But debate ignored the remaining incentive for intangible assets. This incentive might be justified in the case of R and D, but it is hard to justify for advertising.

\*D. Fullerton and A. B. Lyon, "Tax Neutrality and Intangible Capital," NBER Working Paper No. 2430, November 1987, and in *Tax Policy and the Economy*, Vol. 2., L. H. Summers, ed. Cambridge, MA: MIT Press, 1988.



## Can We Copy the European Monetary System?

Alberto Giovannini

### Introduction

Greeted with considerable skepticism in 1978, the European Monetary System (EMS) is enjoying remarkable popularity now. This improvement in its reputation occurred because of changes in the international monetary system between 1971–8 and 1979 to the present.

Following the collapse of the Bretton Woods system in 1971, there were several attempts to limit exchange rate fluctuations by forming a “snake” that loosely linked several European currencies. These attempts proved to be a failure for France and Italy. Both countries tried to join the snake but eventually abandoned their efforts. In contrast, Belgium, the Netherlands, and West Germany entered the snake in 1972 and remained in it until the EMS began in 1979.

The failed attempts of France and Italy, and the suspicion that the new EMS was more gimmick than substance, justified the skepticism of observers in 1978. During the 1980s, however, the events in the world financial markets renewed and exacerbated many countries' dissatisfaction with flexible exchange rates. The unprecedented swings of the nominal and real exchange rate of the dollar, associated with a dramatic worsening of the U.S. current account balance, and the new position of the United States as the largest debtor in the world economy have led many observers to believe that flexible exchange rates are inherently unstable and that a reform of the international monetary system is desirable. In one form or another, all of the main proposals for world monetary reform would limit exchange rate flexibility.

In contrast with the gyrations of the dollar, EMS currencies and indexes of competitiveness within the EMS have been relatively stable over the past ten years. At the same time, inflation rates and inflation rate differentials inside the EMS have been reduced dramatically. Hence there has been a shift in public opinion and a renewed interest in the EMS.

The seeming success of the EMS naturally suggests that it might be copied outside of Europe. However, to understand the feasibility of limiting exchange rate flexibility at the world level, it is necessary to understand why the EMS was viable. First, why is the aversion to exchange rate fluctuations apparently stronger in Europe than elsewhere? Second, how does the EMS hold together; that is, what are the benefits of belonging to the system?

### Why Did Europeans Set Up the EMS?

The coordination of macroeconomic policies has a long tradition in Europe: it dates back at least to the 1950s when six European countries signed the Treaty of Rome. That treaty established a customs union and a common market for cereals—later extended to all agricultural products—but its intentions were much more ambitious. It laid down a set of principles for its members: mutual consultations about short-run macroeconomic policy; a commitment to “regard exchange rate policy as a matter of common interest”; and the possibility of mutual assistance to overcome balance-of-payments crises.

Moreover, the Europeans have a special aversion to exchange rate fluctuations, motivated by three factors: first, in the 1920s and 1930s, many European countries sought to defend themselves against external shocks through competitive exchange rate depreciations. Some Europeans today believe that those policies contributed to the disruption of international trade and economic activity, the rise of Nazism, and ultimately to World War II.

The second explanation for Europeans' distaste for exchange rate fluctuations is the pattern of trade. The ratio of imports from outside the European Economic Community (EEC) to GDP is about the same as the ratio of imports to GDP for the United States and Japan: 10 to 12 percent. However, internal EEC trade is much higher. Total imports are 60–70 percent of GDP in Belgium and the Netherlands and 25–30 percent in Germany, France, Italy, and the United Kingdom. Since most international trade in Europe is inside the EEC, the fluctuations of exchange rates within the EEC pose more of a problem than fluctuations with the dollar or the yen.

Third, as I have explained in my work with Francesco Giavazzi,<sup>1</sup> the survival of the common agricultural market depends upon the stability of intra-European exchange rates. For many years, the common agricultural policy (CAP) was the only important activity of the EEC and the main reason for its existence: in the early 1970s, the CAP absorbed 90 percent of the total EEC budget; in 1985 the figure was still as high as 73 percent. It is unlikely that the EEC would still exist if it failed to keep the common agricultural market alive, and its success with the CAP would have been unlikely if internal exchange rate fluctuations had been large. Thus the planned liberalization scheduled for 1992 is partly the result of the perceived success of the EMS.

For many of the countries that belong to the EMS, leaving the system would be associated with the abandonment of other areas of European cooperation as well. On some crucial occasions, the links between the EMS and other institutions of European cooperation

<sup>1</sup>F. Giavazzi and A. Giovannini, *Limiting Exchange Rate Flexibility: The European Monetary System*, Cambridge, MA: MIT Press, forthcoming.



have been instrumental in forcing policy shifts that, in turn, have made the survival of the exchange rate system possible.

## The EMS Is an (Imperfect) Greater Deutsche Mark Area

Ten years of the EMS constitute an important case for those who want to design new forms of international monetary coordination. In any regime of fixed exchange rates, the task of running monetary policy is not assigned explicitly to any one country. Are the use of an external numeraire, such as gold in the earlier regimes, or the creation of consultative bodies, such as the EEC Monetary Committee and the Committee of Central Bank Governors, effective enough to induce international cooperation? The evidence from the EMS suggests not.

The EMS, like the gold standard and the Bretton Woods system, is characterized by a "center" country—West Germany—whose central bank pursues its own monetary targets independent of the policies pursued by the other members.<sup>2</sup> The other countries have converged to a significant extent toward West Germany's monetary policies but have maintained limited independence by controlling capital flows and by periodically devaluing their currencies.

The EMS actually has worked as an imperfect greater deutsche mark (DM) area: West German interest rates are unaffected by most intra-EMS shocks, like the expectations of parity realignments, while interest rates denominated in the other currencies suffer the full impact of intra-EMS portfolio disturbances. Italy and France, for example, have prevented wide fluctuations in their own interest rates from affecting their domestic policies only by imposing capital controls.

Why did the member countries run monetary policy in the EMS in this asymmetric way? There is some evidence that Italy, France, Denmark, and Ireland took advantage of the situation by pursuing otherwise unpopular monetary and fiscal policies to fight domestic inflation that they claimed were justified by the "external constraint" of the EMS. The enhanced credibility of these policies reduced somewhat the costs in unemployment of the disinflation effort carried out by these countries.

What incentive does Germany have to belong to such a system? The behavior of *effective* indexes of external competitiveness before and after the setup of the EMS suggests that the system has protected Germany from the effects of dollar fluctuations. In the 1970s, at the time of the first dollar collapse, the DM appreciated both vis-à-vis the dollar and vis-à-vis its European partners; the result was a large swing in Germany's terms

of trade. After the dollar's fall in 1985, the EMS currencies followed the DM much more closely and softened the impact on Germany's terms of trade. The comparison between the two periods clearly shows the extent to which the EMS has stabilized Germany's overall competitiveness. From November 1969 to March 1973, the DM appreciated 25 percent vis-à-vis the dollar; this was accompanied by an 18.6 percent worsening of Germany's overall competitiveness. From January 1985 to December 1987, the DM appreciation was 27 percent, but this time it was accompanied by a loss of competitiveness of only 9 percent.

## Can the EMS Be Copied Outside of Europe?

Clearly, an institution like the EMS would not work outside of Europe, for a number of reasons. The European countries have a number of incentives to belong to the EMS: large trade flows within Europe, for example, and integration of institutions, like the EMS, which lend credibility to the EMS exchange rate targets. These incentives are not present among the United States, Europe, and Japan, for example.

Second, the operation of monetary policy has not been linked to the exchange rate constraint by all countries: Germany appears to have pursued its own monetary targets without attempting to cooperate with other countries, while the other countries either have followed Germany's policies, changed exchange rates, or imposed capital controls. Thus, the EMS has not fostered international cooperation but instead has replicated the relationships of the Bretton Woods system. The striking similarity between the EMS and previous experiences under fixed exchange rates suggests that the institution of fixed rates per se cannot induce international monetary policy cooperation.

## Annual Research Conference—IV:

# Monetary Aggregates and Monetary Policy\*

Benjamin M. Friedman

Economists have long understood that the quantity of money, or its growth rate, can play a useful role in the monetary policy process only to the extent that

<sup>2</sup>A. Giovannini, "How Do Fixed Exchange Rate Regimes Work? The Evidence from the Gold Standard, Bretton Woods, and the EMS," NBER Working Paper No. 2766, November 1988, and in *Exchange Rate Regimes and Macroeconomic Policy*, B. J. Eichengreen, M. M. Miller, and R. Portes, eds. Cambridge, England: Cambridge University Press, forthcoming.

\*This presentation draws primarily on my joint work with Kenneth N. Kuttner, "Money, Income, and Prices After the 1980s," forthcoming as an NBER Working Paper. It also draws in part on my earlier papers: "Monetary Policy Without Quantity Variables," NBER Working Paper No. 2552, April 1988, and *American Economic Review* (May 1988), pp. 440-445; and "Lessons on Monetary Policy from the 1980s," NBER Working Paper No. 2551, April 1988, and *Journal of Economic Perspectives* (Summer 1988), pp. 51-72.

fluctuations in money over time regularly and reliably correspond to fluctuations in income, or prices, or whatever other aspects of economic activity the central bank seeks to influence. The same is true, of course, for any other financial quantity—nonmoney assets, for example, or measures of credit—or, for that matter, interest rates and any other financial prices.

Different ways of conceptually basing the monetary policy process on money place different requirements on the empirical relationships between money and the economic variables that are of ultimate policy concern. These relationships in turn depend on such basic dimensions of economic behavior as the nature of the economy's aggregate supply process, the degree of price flexibility, the response of interest rates and aggregate demand to wealth, and, importantly, the public's money demand behavior and the banks' money supply behavior.

For example, using money as an "intermediate target"—that is, determining the money growth rate most likely to be consistent with the central bank's macroeconomic policy objectives, and then conducting monetary policy operations during some time interval as if achieving that level of money growth were itself the policy objective—would be genuinely optimal only if the demand for money were not only completely stable but also insensitive to interest rates. Looser relationships would suffice if money were to be used simply as an "information variable"—that is, if policy operations were adjusted during some interval in response to the actual growth of money departing from its chosen path, and perhaps in response to analogous departures for other variables, but not in a way designed necessarily to restore money growth to the target path.

However, what is essential to either of these ways of proceeding is that there be at least some reliably exploitable connection between money and either income or prices; that is, that observed departures of money from some target path have systematic implications for income or prices in the future. Otherwise money, as a variable that the central bank cannot set directly as a policy instrument, has no role in the policy process. From the perspective of information, there is no point to the central bank's reacting to fluctuations in money if those fluctuations bear no implication for subsequent movements in income or prices. From an intermediate-target perspective, there is even less point to making policy as if controlling money were randomly equivalent to controlling income and prices if in fact there is no relationship between them.

For this reason, the events of the 1980s have subverted what had almost come to be standard ways of formulating and implementing monetary policy, not just in the United States but in many other countries as well. While there was never any lack of debate about the strength or weakness of the empirical relationships connecting money to income and prices, and therefore about the appropriate role of money in the monetary policy process, there was widespread agreement before the 1980s that fluctuations in money did con-

tain at least potentially useful information about future income and price movements. In the 1980s, however, the empirical basis underlying that agreement has disappeared. Empirical analysis based on sample periods that include the 1980s simply does not corroborate what were commonly accepted facts of economic behavior not so many years earlier. Not surprisingly, in this environment some central banks, including the Federal Reserve System in the United States, have altered or abandoned the ways in which they had previously relied on money to make policy.

The evidence along these lines that I have reported in my most recent research seems all the more persuasive because the same results emerge repeatedly from different ways of looking at the data. First, some simple equations relate the quarterly growth rate of nominal income to lagged growth rates of some financial aggregate (typically money) and to high employment government spending. For the sample spanning 1960:II–1979:III—that is, from the earliest time for which the Federal Reserve provides data corresponding to its current definitions of the monetary aggregates until the introduction of its new monetary policy procedures in October 1979—such equations for the financial aggregate (defined as M1, M2, M3, the monetary base, or total domestic credit) all are modestly successful in accounting for nominal income growth. These equations explain anywhere from 23 percent to 32 percent of the overall variation of income growth.

Extending the sample to include data through the end of 1986 sharply lowers the fraction of income growth that each aggregate explains, however, leaving not one as high as 20 percent. Dropping the observations from the 1960s, thereby focusing on the most recent 17 years of experience, eliminates the explanatory power of these equations almost altogether. For the 1970:I–1986:IV sample, not one of these equations explains even as much as 10 percent of the variation of income growth.

Second, in recent years empirical consideration of whether money (or any other aggregate) can play a useful role in the monetary policy process has focused not just on whether past fluctuations of money help to predict fluctuations of income (or prices, and so on) but on whether they help to predict fluctuations of income *that are not already predictable on the basis of past fluctuations of income itself* (and/or other readily observable variables). Especially in the context of the information-variable approach to monetary policy, the much-debated issue of whether statistical tests constitute valid tests of "causality" is beside the point. As long as movements in money contain information about future movements in income beyond what already is contained in movements in income itself, monetary policy can exploit that information by responding to observed money growth regardless of whether the information it contains reflects true causation, reverse causation based on anticipations, or mutual causation by some independent but unobserved influence. In the 1960:II–1979:III sample, each of M1, M2, and credit contained

information about future income movements that was highly significant statistically at any plausible confidence level, regardless of whether the analysis did or did not include the government spending variable. Merely including data through 1987 sharply reduces the significance of the information provided by M1, and eliminates altogether any significance for the information provided by credit. Dropping the data from the 1960s eliminates any significance whatever from the information provided by M1, M2, or credit.

Third, equations in which the variable whose movements are to be explained is not nominal income, but either real income or the price level, again deliver analogous results. As is consistent with much of the existing literature, the pre-1980 evidence is mixed, depending on which financial aggregate the equation includes, whether the dependent variable is income or prices, and whether or not the equation includes the fiscal variable. Nevertheless, through 1979 each of M1, M2, and credit contained significant information about future movements of at least one of real income or prices, under at least one specification of the relationship. Including data through 1987 eliminates most of these positive results. Dropping the data from the 1960s essentially eliminates them altogether.

Fourth, ever since the Federal Reserve first began to formulate monetary policy in terms of money growth targets, a continually nagging question has been whether to "let bygones be bygones" and set each new year's target without respect to whether the last year's actual money growth was in line with the stated target—that is, to allow what most observers of monetary policy have come to call "base drift"—or, alternatively, to combat "base drift" by setting each new year's target so as to offset any deviation of actual money growth from the target in the previous year. This issue, too, hinges on the nature of the money-income relationship. For data up to 1979:III, the evidence indicates that the relationship between money and income warranted combating "base drift" for targets based on growth of M2 or credit (although not for either M1 or the monetary base). Including data through 1987 eliminates the evidence in favor of such a relationship for any of these aggregates.

These results—and others like them—have strongly negative implications for monetary policy frameworks that focus the design and implementation of policy on money (or credit) in any formally systematic way. There is no longer empirical evidence to support the existence of relationships that would warrant making monetary policy in such ways. The point is not just that the money-income relationship does not satisfy the stringent conditions that would be required to render optimal the strict use of money as an intermediate target. More importantly, there is no evidence to show that fluctuations in money contain any incremental information about subsequent movements in income or prices.

Meanwhile, the Federal Reserve System has not ceased operations. Nor should it be inclined to do so, in light of

the performance of both income and prices during the past five years. Six years of fairly steady economic growth, with inflation consistently lower than at any time since before the Vietnam War, represents no small achievement by today's standards. In the world of practical affairs, it is difficult to argue with success.

Notwithstanding the Federal Reserve's continuing formulation of money growth targets that it reports to Congress, as current law requires, and even notwithstanding the relatively high success rate in meeting the target for M2, it seems clear enough that the Federal Reserve System since mid-1982 has centered its monetary policy actions primarily around controlling short-term nominal interest rates. In so doing, Federal Reserve decisionmakers have no doubt taken account of the movements of money (and perhaps credit, too); but they also have taken account of many other potential information sources, including longer-term asset prices and yields, dollar exchange rates, and numerous aspects of nonfinancial economic activity. More to the point, apparently they have proceeded in the absence of any well-articulated conceptual framework linking the interest rate as the chief policy instrument to the main macroeconomic policy objectives, or linking the associated large and diverse information base to either the policy instrument or the policy objectives. Although procedures differ in various details, the overall approach is strongly reminiscent of the practice of the 1950s and 1960s.

Therefore, it is useful to ask why the policy approach followed at that time failed. The voluminous investigation of this question, both at the time and subsequently, supported three general conclusions: First, Federal Reserve officials systematically confused the level of interest rates as the instrument of monetary policy with the level of interest rates as an ultimate objective of monetary policy. As a result, they usually delayed too long before raising or lowering interest rate levels, and even then made changes of insufficient magnitude. Second, with no nominal quantity at the center of the policy process, the overall approach lacked an anchor to provide price stability. Although inflation therefore was not inevitable, there was little protection against it when various inflationary pressures arose. Third, once inflation did emerge, Federal Reserve officials (and many other people too) often failed to distinguish nominal from real interest rates. As a result, they often associated higher observed interest rates with a tighter policy stance even when the increase in nominal interest rates merely kept pace with, or even fell short of, rising inflation expectations.

Are these three flaws inherent in the approach to monetary policy that the Federal Reserve System followed 25 years ago, and that it apparently has been following again since mid-1982? Or is it possible to design and implement monetary policy along these lines, albeit in a way that has learned from the still relatively recent past? Were the familiar failures of monetary policy under this approach in the past inevitable? Or

does the experience of the last five years show that this kind of monetary policy can work, and work well? Research on these questions may be the best contribution economists concerned with monetary policy can make now.

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## Economic Outlook Survey

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### Fourth Quarter 1988

Victor Zarnowitz

According to the December survey of 15 professional forecasters taken by the NBER and the American Statistical Association, the economy will continue expanding through 1989, although at a decreasing rate. Inflation and interest rates are expected to increase moderately. Measured in constant dollars, residential construction is predicted to decline less in 1989 than it did in 1988. Federal government purchases, down significantly in 1988, are expected to show a slight real gain in 1989. In contrast, plant and equipment again will be the main sources of strength, rising much faster than total real GNP, although less in 1989 than in 1988, according to the median forecasts.

#### Slower Growth Likely But No Recession in 1989

Forecasts of growth in the economy's output (at annual rates) average 2.6 percent for 1988:4 and 3.6 percent, 2.9 percent, 2.4 percent, and 1.1 percent for the four successive quarters 1989:1-1989:4. Real GNP is expected to gain 3.9 percent in 1987-8 and 2.9 percent in 1988-9. However, there is much dispersion around these median figures: the range for 1989 is 1.7-4.0 percent.

Several respondents see sharply lower growth in 1989:4, and one predicts a 2 percent decline in growth. This may foreshadow a recession in 1990, but the likelihood of a downturn in 1989, while rising, is not regarded as very high now. The mean probabilities that real GNP will fall increase from 10 percent in 1989:1 to 19 percent, 22 percent, and 24 percent in the following three quarters through 1989:4. The highest predicted probabilities are 50 percent for 1989:3 and 60 percent for 1989:4.

The prevailing view is that the current business expansion will continue for another record year, its seventh. No previous peacetime expansion in the United States has exceeded five years.

### Unemployment Steady, Inflation Higher

Unemployment in 1989 will remain at 5.5 percent of the civilian labor force, the same as in 1988, according to the survey averages. The predictions range from 5.1-6.0 percent for 1989 and 5.0-6.2 percent for 1989:4; the standard deviations are 0.3 percent in both cases.

The GNP implicit price deflator (IPD) is expected to rise 3.3 percent in 1987-8 and 4.4 percent in both 1988-9 and 1988:4-1989:4. Inflation, in terms of consumer prices, is predicted to be higher, with annual averages of 4.1 percent and 5.0 percent. Nearly all the respondents believe that inflation will increase. The highest forecast of the Consumer Price Index for 1989:4 is 6.5 percent, the lowest is 3.5 percent, and the standard deviation is 0.8 percent.

### Chances and Risks

We collect probabilistic as well as point forecasts. The former reflect uncertainty more directly and more strongly than the latter. The distributions of the mean probabilities attached to the possible percentage changes in U.S. output can be summarized as follows:

<i>Relative Change in Real GNP</i>	<i>1987-8</i>	<i>1988-9</i>
4.0 percent or more	23	14
2.0-3.9 percent	68	62
0-1.9 percent	9	20
Negative	0	4

The chances of high growth in real GNP are seen as much lower in 1989 than in 1988; the chances of very low or negative growth are much higher; but more than 60 percent of the distribution of the new forecasts falls into the modal range of 2.0-3.9 percent.

For inflation, there is a much greater rise in uncertainty but also a clear shift toward higher figures in 1989.

<i>Relative Change in IPD</i>	<i>1987-8</i>	<i>1988-9</i>
8 percent or more	0	2
6.0-7.9 percent	3	11
4.0-5.9 percent	18	59
Less than 4.0 percent	79	28

### Peaks in Interest Rates

The three-month Treasury bill rate is forecast to peak at 7.7 percent in 1989:1. After the sharp rise from about 7 percent in 1988:3, the rate is expected to settle near 7.6 percent for the rest of the year. However, the distributions of the individual forecasts are skewed toward much higher figures. The range for 1989:4 is 6.5-9.2 percent; for 1989 as a whole, the range is 6.9-8.6 percent.

The yield on new high-grade corporate bonds is predicted to inch up from 10.1 percent to 10.2 percent in the last two quarters of 1988; it should reach a peak of 10.5 percent in mid-1989, then fall to 10.3 percent in 1989:4. The range for 1989:4 is 9.4-11.5 percent; for 1989 on the whole the range is 9.4-11.3 percent. It appears that the pattern of short rates catching up with the long ones, which often is observed in late expansion, is expected to persist.

## Projections of GNP and Other Economic Indicators, 1988-9

	Annual				
	1987 Actual	1988 Forecast	1989 Forecast	Percent Change	
				1987 to 1988	1988 to 1989
1. Gross National Product (\$ billions)	4526.7	4857.0	5207.0	7.3	7.2
2. GNP Implicit Price Deflator (1982 = 100)	117.7	121.6	126.9	3.3	4.4
3. GNP in Constant Dollars (billions of 1982 dollars)	3847.0	3995.9	4110.1	3.9	2.9
4. Unemployment Rate (percent)	6.2	5.5	5.5	-0.7 <sup>1</sup>	0.0 <sup>1</sup>
5. Corporate Profits After Taxes (\$ billions)	142.9	163.0	175.5	14.1	7.7
6. Nonresidential Fixed Investment (billions of 1982 dollars)	445.1	490.8	518.0	10.3	5.5
7. New Private Housing Units Started (annual rate, millions)	1.62	1.47	1.46	-9.26 <sup>2</sup>	-0.68 <sup>2</sup>
8. Change in Business Inventories (billions of 1982 dollars)	34.4	41.0	32.2	6.6 <sup>3</sup>	-8.8 <sup>3</sup>
9. Treasury Bill Rate (3-month, percent)	5.83	6.60	7.55	0.77 <sup>1</sup>	0.95 <sup>1</sup>
10. Consumer Price Index (annual rate)	3.6	4.1	5.0	0.5 <sup>1</sup>	0.9 <sup>1</sup>

	Quarterly						Percent Change	
	1988 Q3 Actual	1988 Q4	1989 Forecast				Q3 88 to Q3 89	Q4 88 to Q4 89
			Q1	Q2	Q3	Q4		
1. Gross National Product (\$ billions)	4899.5	4982.0	5075.0	5165.0	5256.0	5323.8	7.3	6.9
2. GNP Implicit Price Deflator (1982 = 100)	122.3	123.6	125.0	126.4	127.9	129.0	4.6	4.4
3. GNP in Constant Dollars (billions of 1982 dollars)	4007.3	4033.0	4069.0	4098.6	4123.4	4134.5	2.9	2.5
4. Unemployment Rate (percent)	5.5	5.4	5.4	5.5	5.5	5.5	0.0 <sup>1</sup>	0.1 <sup>1</sup>
5. Corporate Profits After Taxes (\$ billions)	166.1	169.7	171.5	173.5	172.5	171.5	3.9	1.0
6. Nonresidential Fixed Investment (billions of 1982 dollars)	495.7	502.0	509.0	515.0	520.0	524.0	4.9	4.4
7. New Private Housing Units Started (annual rate, millions)	1.45	1.47	1.46	1.47	1.45	1.42	-0.28 <sup>2</sup>	-3.73 <sup>2</sup>
8. Change in Business Inventories (billions of 1982 dollars)	33.8	29.0	34.0	33.3	32.0	30.0	-1.8 <sup>3</sup>	1.0 <sup>3</sup>
9. Treasury Bill Rate (3-month, percent)	6.99	7.50	7.70	7.65	7.60	7.63	0.61 <sup>1</sup>	0.13 <sup>1</sup>
10. Consumer Price Index (annual rate)	5.4	5.0	4.8	4.8	4.9	5.0	-0.6 <sup>1</sup>	0.0 <sup>1</sup>

SOURCE: The National Bureau of Economic Research and American Statistical Association, Business Outlook Survey, December 1988. The figures on each line are medians of fifteen individual forecasts.

<sup>1</sup>Change in rate, in percentage points.

<sup>2</sup>Possible discrepancies in percentage changes are caused by rounding.

<sup>3</sup>Change in billions of dollars.

### Smaller Gains in Consumption, Smaller Losses in Housing

Real consumption expenditures are estimated to have grown 2.7 percent in 1987-8. They are predicted to gain 2.4 percent in 1988-9 and 2.2 percent in 1988:4-1989:4. The median forecast suggests that consumers, although more cautious, will maintain a steadily expanding volume of expenditures through most of this year. However, consumption is expected to slip one-half of one percentage point to 1.8 percent in 1989:4.

New private housing starts, having fallen 9.3 percent in 1988, are forecast to decline only 0.7 percent in 1989. The corresponding average forecasts for residential fixed investment are -2.7 percent and -0.5 percent.

### Quiet Strength After the Boom in Business Investment and Exports

Nonresidential fixed investment probably rose more than 10 percent in constant dollars between 1987 and 1988, an excellent record. The median forecast for 1988-9 is a much less exuberant 5.5 percent. Growth of outlays in plant and equipment are predicted to slow during the year: the projected gain for 1988:4-1989:4 is 4.4 percent. Even so, business investment will be a source of considerable strength for the economy at large.

Exports, too, are expected to grow faster than real GNP, although not as rapidly as in the recent past. The trade deficit, measured by net exports of goods and services in billions of 1982 dollars, declined from -129

in 1987 to an estimated -97 in 1988. The median forecast for 1989 is -82.

## Mixed Outlook for Industrial Production and Corporate Profits

Output of manufacturing, mining, and utilities is estimated to have gained as much as 5.5 percent in 1987-8. The average prediction for 1988-9 is 3.6 percent, but a rise of only 2.1 percent for 1988:4-1989:4, and zero growth in 1989:4. Corporate profits after taxes in current dollars are expected to increase 7.7 percent in 1988-9, little more than the 7.2 percent projected gain in nominal GNP. However, profits are expected to rise in the first half and decline in the second half of the year. This would be a weak showing, particularly when compared with the 14 percent estimated by the group for 1987-8.

## Government Spending and Policy Assumptions

Federal government purchases of goods and services in constant dollars have declined an estimated 2.9 percent in 1987-8, despite a rather large rise in 1988:4. A similar pattern is expected in 1989: that is, declines or no change, except in the last quarter. The average forecast for 1988-9 is only slightly positive: 0.9 percent.

State and local government purchases are predicted to increase 2.7 percent in 1987-8 and 2.4 percent in 1988-9.

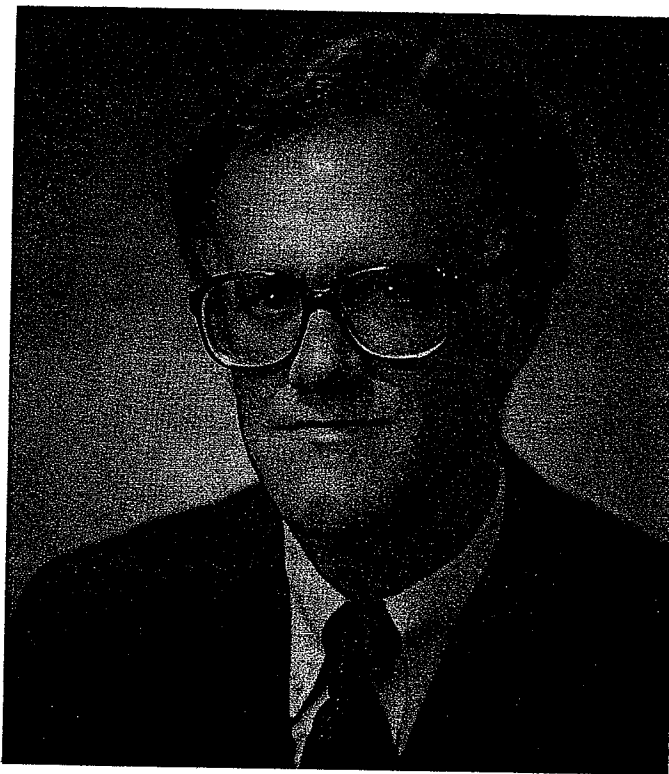
Forecasters are divided on the outlook for tax policy. About half expect no significant changes, while half expect increases in excise taxes of 5-10 percent in fiscal year 1990. Most forecasters anticipate either "little or no change" in defense outlays, or small decreases in real terms and relative to GNP.

Estimates of monetary growth range from 3 percent to 6 percent for M1 and from 2 percent to 8 percent for M2 in 1989. The assumptions about the dollar, energy prices, and changes in the volume and terms of trade vary greatly across the respondents.

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

## John Herron Biggs

John H. Biggs, recently elected president of TIAA/CREF (Teacher's Insurance & Annuity Association/



College Retirement Equities Fund), is a new member of the executive committee of the NBER's Board of Directors. Biggs received his A.B. from Harvard University in 1958 and his Ph.D. in economics from Washington University in 1983. He is also a fellow of the Society of Actuaries.

From 1958-77 Biggs was associated with General American Life Insurance Company in various management positions, with much of his early career as a pension actuary. In 1977, he was appointed vice chancellor for financial affairs at Washington University; from 1979-85 he served as vice chancellor for administration and finance there. Biggs joined Centerre Trust Company (St. Louis) as president and chief executive officer in 1985.

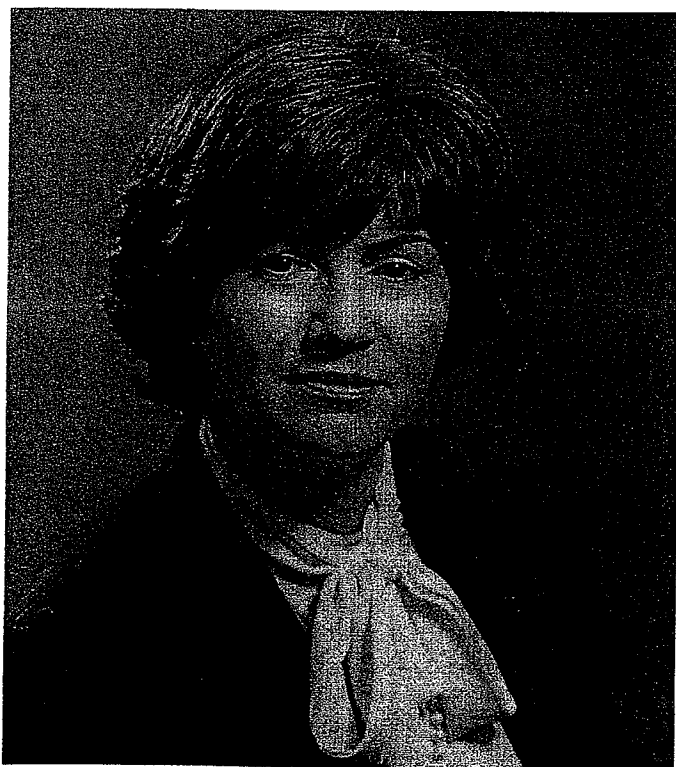
Pension plans continue to be Biggs's business and research interest. He has written on variable annuities, the effects of Social Security on private life insurance,

and the impacts of nondiscrimination rules on private pension plan formation.

Biggs also has had a continuing interest in environmental questions and currently is completing a five-year term as president of the Missouri Botanical Garden, which conducts a major research program in tropical botany.

## Kathleen B. Cooper

Kathleen B. Cooper, a new member of the executive committee of the NBER's Board of Directors, is executive vice president and chief economist of Security Pacific National Bank and head of the bank's Economics Group. A native of Texas, Cooper received her bachelor's and master's degrees from the University of Texas at Arlington, and her Ph.D. in economics from the University of Colorado.



Before joining Security Pacific in 1981, Cooper spent ten years as corporate economist and then chief economist of the United Banks of Colorado in Denver. She also is a past president of the National Association of Business Economists, and a member of the board of trustees at Scripps College.

Cooper's husband, Ronald, is chairman of the math department at the Buckley School in Los Angeles. They have two sons: Michael, 13, and Christopher, 8. Cooper's hobbies are skiing, travel, and reading.

## James S. Duesenberry

James S. Duesenberry, the William Joseph Maier Professor of Money and Banking at Harvard University, has been a member of the NBER's Board of Directors since 1983. Duesenberry received his A.B., A.M., and Ph.D. degrees from the University of Michigan. He joined Harvard's economics faculty as an assistant professor in 1948 and was promoted to associate professor in 1953 and to professor in 1957. Duesenberry also chaired the Harvard economics department from 1972-7.

In 1966-8, Duesenberry was a member of the President's Council of Economic Advisers. He chaired the Board of Directors of the Federal Reserve Bank of Boston from 1969-74.

Duesenberry and his wife, Margaret, live in Belmont, MA. They have four grown children. In his spare time, Duesenberry plays tennis.

## James L. Pierce

James L. Pierce, a member of the NBER's Board of Directors since 1977, has been a professor of econom-



ics at the University of California, Berkeley, since 1976. He was born in Berkeley in 1937 and received both his B.A. and his Ph.D. from U.C., Berkeley.

Pierce was a member of the Cowles Foundation and



the economics department at Yale University from 1963–6. In 1966, he went to Washington to serve on the senior staff of the Board of Governors of the Federal Reserve System. He left the Fed in 1975 to direct a study of financial institutions for the House Committee on Banking, Currency, and Housing. Pierce also taught graduate courses at the University of Maryland during 1966–74.

Since leaving Washington in 1976, Pierce has served as an advisor or consultant to a number of congressional committees and government agencies, and to the Bank of England, Bank of Spain, and Bank of Japan. Pierce also has written numerous articles on macro and monetary economics and on banking. In 1984 he published the text titled *Monetary and Financial Economics*.

Pierce has three children: Jonathan, Susan, and Samuel. His hobbies are cooking and hiking.

Paul R. Krugman, jointly with Lael Brainard, MIT, "Problems in Modeling Competition in the Aircraft Industry"

Richard Baldwin, NBER and Columbia University, "On Taking the Calibration out of Calibration Studies"

Richard Harris, Queen's University, jointly with Victoria Kwakwa, University of Regina, "The 1988 Canada–United States Free Trade Agreement: A Dynamic General Equilibrium Evaluation of the Transition Effects"

Dani Rodrik, NBER and Harvard University, "Industrial Organization and Product Quality: Evidence from South Korean and Taiwanese Exports" (NBER Working Paper No. 2722)

Klaus Zimmerman, Mannheim University, jointly with Lorenzo Pupillo, University of Pennsylvania, "Relative Export Prices and Firm Size in Imperfect Markets"

Klepper focuses on the role of economies of scope (that is, the effect on firms' costs of the size of their product range) in the development and production of large passenger aircraft. His simple model has two firms, with a production technology characterized by significant fixed costs and marginal costs that fall in consequence of learning-by-doing. Assuming that each firm takes the sales levels of the other as given when it makes its sales decisions, Klepper finds that the equilibrium is quite sensitive to changes in the model's parameters. Each firm produces more than one type of aircraft and benefits from economies of scope. Klepper finds that such economies have important effects on the equilibrium of his model.

Krugman and Brainard argue that the aircraft industry is not characterized simply by small-group competition, huge development costs, and a steep learning curve. Other features of this industry also are significant. Aircraft are long-lived capital goods and there are long-term supplier–customer relationships between aircraft manufacturers and airlines. A key element in Krugman and Brainard's argument is that estimates of the overall demand for travel, combined with the fact that aircraft capital costs represent only around 20 percent of the total costs of running an airline, and that there is little scope for substitution between aircraft and other inputs, suggest that the demand elasticity for aircraft should be very low. Why then, in an industry with small numbers of firms and very inelastic demand, are prices not greatly in excess of costs of production? Krugman and Brainard suggest that the firm with the lowest cost sets a price that is constrained by the average cost of the firm with the next lowest cost if it had taken the market; the firm then sells all it can at that price. After the firm has captured the market, it is constrained from subsequent price increases by the need to maintain its reputation for the future.

Baldwin questions the methodology of the recent empirical work on the evaluation of strategic trade policies. Such empirical evaluation is inherently diffi-

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## Conferences

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### Empirical Studies of Strategic Trade Policy

Recent developments in the theory of international trade suggest that the scope for government interference with free trade may be greater with imperfect competition than is suggested by the traditional analysis of international trade under perfect competition. However, some economists doubt both the empirical robustness of certain theoretical models and the likely magnitude of the effects analyzed. These issues can be resolved only by confronting theoretical models with data from the real world.

Since 1986, the NBER and the Center for Economic Policy Research (CEPR) have had a joint research project on "Empirical Studies of Strategic Trade Policy" with this objective, funded by the Ford Foundation.

A workshop, organized by Alasdair Smith, CEPR and University of Sussex, and Paul R. Krugman, NBER and MIT, was held at the University of Sussex on July 8–9, to discuss work in progress in the research program. The following papers were discussed:

Gernot Klepper, Kiel Institute for World Economics and CEPR, "Simulating Competition in the Market for Large Transport Aircraft"

cult for three reasons: there is no general agreement on how to model imperfect competition; crucial data on firm-specific costs, prices, and market shares often are unavailable, unreliable, or unobservable; and industrial targeting policies can result in such dramatic changes in industry structure that standard empirical tools are of little use. The typical study uses a minimal amount of data to obtain model parameters and therefore can be subject neither to a satisfactory sensitivity analysis nor to statistical analysis.

Harris and Kwakwa consider the effects of removing trade barriers between the United States and Canada. Their model permits trade-induced unemployment, so that the adjustment costs can be brought into the economic evaluation. It has firms that are imperfectly competitive and have economies of scale, but as a result of sluggish wage adjustment there is both frictional and natural unemployment in the labor market. Harris and Kwakwa simulate the effects of gradually reducing trade barriers to zero over a ten-year period. The simulations suggest that trade liberalization: raises employment; leads to entry and exit of firms at a modest rate; raises trade volumes, with Canadian imports rising more than exports (implying that some currency depreciation would be required to restore current account equilibrium); has little effect on labor reallocations; and raises both real and nominal wages.

Rodrik looks at the transition by industrializing countries from standardized labor-intensive manufactures to more sophisticated skill-intensive products. He proposes that such a transition is achieved more easily when the domestic industry is highly concentrated. Firms cannot easily provide accurate signals to export markets of the true quality of their products. When perceived quality depends on other firms' quality as well as the true quality of the firms' own products, there is an externality that discourages firms from investing in quality. It is easier to overcome this externality in more concentrated industries. Rodrik compares South Korea and Taiwan, since Korean industry is much more concentrated than Taiwan's but these two countries are similar in many key aspects of their development. He compares 49 product classifications in which at least one of the two countries had exports to the United States exceeding \$100 million, and he finds that in 30 out of the 49 classes, Korean unit values were higher. Further, using Japanese unit values as a proxy for quality, Rodrik finds that the Korean unit value premium over the Taiwanese increases with product quality.

Zimmerman and Pupillo use the results of a large-scale Italian survey of firms' pricing to investigate the relationship between domestic and export prices. If domestic and foreign markets are segmented by transport costs, and if market power has no influence on price-cost margins, then one would expect firms to charge higher prices abroad than in the home market. However, the survey shows that prices were higher in the home market. Zimmerman and Pupillo interpret this as indicating that market power affects margins and that firms face more elastic demand in foreign than

in home markets. Further, increasing firm size and market concentration tend to be associated with lower relative export prices, while higher export shares are associated with higher relative export prices.

The workshop concluded with two brief presentations of work in progress. Anthony Venables, University of Southampton and CEPR, discussed joint work with Michael Gasiorek, University of Sussex, and Alasdair Smith, on tariffs, subsidies, and retaliation. Their preliminary results suggest that imperfect competition implies a welfare-increasing role for import tariffs and export subsidies, but that role is greatly diminished in the presence of effective competition policy. The threat of retaliation does not necessarily deter either tariffs or subsidies, since the outcome of tariff and subsidy was may be superior to free trade for some countries.

David Ulph, University of Bristol and CEPR, and Alan Winters, University College of North Wales and CEPR, discussed the implications of introducing intersectorial mobility of skilled labor, especially scientific labor, into numerical models of imperfect competition.

## International Trade Seminar

The first annual meeting of the International Seminar on International Trade (ISIT) was held on August 24-25 in Oxford. Sponsored jointly by the NBER and the Center for Economic Policy Research (CEPR), ISIT will examine topics in international trade policy. Its proceedings will be published in special issues of the *Weltwirtschaftliches Archiv*.

Robert E. Baldwin, NBER and University of Wisconsin, and Alasdair Smith, CEPR and University of Sussex, organized the 1988 program:

Drusilla Brown, Tufts University, "Market Structure, the Exchange Rate, and the Current Account: Some Evidence from GCE Trade Models"

Discussant: Gernot Klepper, CEPR and Kiel Institute for World Economics

Simon Cowan, Nuffield College, Oxford, "Trade and Competition Policies for Oligopolies"

Discussant: Richard Baldwin, NBER and Columbia University

Harry Flam, Institute for International Economic Studies, Stockholm, and Richard Baldwin, "Strategic Trade Policy in the Market for 30-40-Seat Aircraft"

Discussant: David de Meza, University of Exeter

Earl Grinols, University of Illinois, "Procedural Protectionism: Promoting Instead of Solving Trade Problems"

Discussant: Christopher Miner, University of Loughborough

Jean L. Waelbroeck, Free University, Brussels, "A Game-Theoretic Analysis of Trade Negotiations"  
Discussant: Geoffrey Carliner, NBER

Carl B. Hamilton, Institute for International Economic Studies, Stockholm, "The Permanence of Protection"

Discussant: Alasdair Smith

John Whalley, NBER and University of Western Ontario, "Coalition Building for Trade Negotiations: Problems and Prospects"

Discussant: Robert E. Baldwin

Patrick Messerlin, University of Paris and The World Bank, "European Antidumping Law"

Discussant: Robert E. Baldwin

Catherine L. Mann, The World Bank, "The Relationship between Exchange Rate Variability and Export Pricing: Examples from the United States, Germany, and Japan"

Discussant: Luc Bauwens, University of Aix-Marseilles

Edward Ray, Ohio State University, "Impact of Rent-Seeking Activity on U.S. Preferential Trade and World Debt"

Discussant: André Sapir, Free University, Brussels

Recent experience with the U.S. dollar suggests that Purchasing Power Parity (PPP) does not hold, even at the firm level, at least in the short run. During the dollar's appreciation, the foreign currency price of sales to the U.S. market exceeded the foreign currency price of sales to other markets in some industries. Brown uses a computable general equilibrium trade model to evaluate a 10 percent appreciation of the U.S. dollar on the price level prevailing in the U.S. market relative to prices in other markets. She finds that depreciation lowers the price level in the U.S. market by 2-3 percent and raises prices in the rest of the world by zero to 6 percent. This implies that significant deviations from PPP can occur following a currency appreciation.

Cowan shows that a country with monopoly power in trade, using competition policy and export tax instruments, will choose to exploit its power by cartelization only if the importing country is induced to set a negative tariff. This occurs when demand is sufficiently convex.

Flam and Baldwin apply the calibration methodology to the market for 30- to 40-seat commuter aircraft. They evaluate the positive and welfare impact of an alleged market access restriction (MAR) in Canada and an alleged Brazilian export subsidy. They find that the Canadian MAR decreases the national welfare of Canada while the Brazilian subsidy increases Brazilian economic welfare.

Grinols describes the changes in U.S. trade law introduced by the Omnibus Trade Act of 1988. He predicts that the new law will increase trade barriers by making it easier for domestic firms to obtain protection under the escape clause and the provisions for antidumping, countervailing duties, and unfair trade practices. Grinols notes that increased "procedural protec-

tion" of this sort offsets the decreases in overt protection in the form of tariffs and quotas.

Walbroeck focuses on the relevance of game theory concepts to global trade negotiation. He argues that international cooperation in trade needs to be sustained by commitments to good behavior by each country that the other countries believe. Selfish optimization by each country cannot sustain a welfare-maximizing equilibrium. Walbroeck also suggests that continued exemption of the newly industrializing countries from the rules of the General Agreement on Tariffs and Trade (GATT) is a dangerous source of trade tension and could lead to a serious breakdown of GATT rules.

Hamilton shows that protection in the international trade of footwear was low in 1970-7, then rose significantly through the introduction of nontariff measures between 1978 and 1982, and has almost disappeared in recent years. The U.S. "orderly market agreements" with Japan and South Korea between 1977 and 1981 triggered a wave of protectionism in Europe, but when the U.S. agreements expired in 1981, protection in Europe was reversed. Footwear protection disappeared rapidly, apparently because workers had a relatively easy time finding new jobs, and because profits in the industry remained high, especially for U.S. and European producers who became footwear importers.

Hamilton and Whalley individually describe the coalitions of developing countries in the current GATT Uruguay Round and evaluate the various options for those countries. They report that the coalitions of developing countries thus far have made joint proposals but have not negotiated exchanges of concessions. Coalitions of a larger group of mid-sized developed and smaller developing countries have been crucial for the progress achieved to date in the Round.

Messerlin illustrates how current antidumping laws consistent with the GATT, such as the European Community Regulations, have a strong protectionist impact. They result in a massive reduction of imported quantities and in trade diversions. He also finds that antidumping laws favor collusion among the domestic firms and between them and the foreign firms. Consequently, these laws represent a threat to the GATT edifice in the long run and to the competition in protected markets.

How do trends and volatility in exchange rates differ across exporters, and how do they affect export pricing strategies? Mann analyzes data on the transaction price for exports of five very disaggregated industrial products from the United States, Japan, and West Germany. She finds that German exporters have experienced relatively smaller trend movements and volatility in exchange rates in their destination markets than have U.S. and Japanese exporters of these products. Neither trend movement of the dollar nor its volatility is very important for the pricing behavior of U.S. firms. Japanese firms are most affected by yen volatility and trend movement. However, German exporters, who have experienced the least movement and volatility,

appear to be the most sensitive to these two factors in their pricing strategies.

Ray analyzes the impact of the U.S. trade preferences available to developing countries—the Generalized System of Preferences (GSP)—on U.S. manufactured imports from major debtor nations in 1985 and 1986. Evidence for Argentina, Brazil, Indonesia, Korea, Mexico, the Philippines, and Venezuela indicates negligible and/or counterproductive effects of the revised GSP on U.S. imports from those countries.

## Residential Real Estate and Capital Formation

The NBER held a conference on Residential Real Estate and Capital Formation in Newport, RI on October 7–8. James M. Poterba, of the NBER and MIT, organized the following program:

Jan Brueckner, University of Illinois, and James A. Follain, Syracuse University, “ARMs and the Demand for Housing”

Discussant: James Kau, University of Georgia

Lawrence H. Goulder, NBER and Harvard University, “Tax Policy, Housing Prices, and Housing Investment”

Discussant: Edwin Mills, Northwestern University

N. Gregory Mankiw, NBER and Harvard University, and David N. Weil, Harvard University, “The Baby Boom, the Baby Bust, and the Housing Market” (NBER Working Paper No. 2794)

Discussant: Robert J. Shiller, NBER and Yale University

Patric H. Hendershott, NBER and Ohio State University, and Robert VanOrder, Federal Home Loan Corporation, “Imperfect Home Mortgage Markets and the Accumulation of Residential Capital”

Discussant: William C. Wheaton, MIT

Joyce Manchester, Dartmouth College, and James M. Poterba, “Second Mortgages, Home Equity Borrowing, and Household Saving”

Discussant: John M. Quigley, University of California at Berkeley

Jonathan S. Skinner, NBER and University of Virginia, “Housing Wealth and Nonresidential Saving”

Discussant: Daniel L. McFadden, NBER and MIT

Yannis M. Ioannides, NBER and Virginia Polytechnic Institute, “Housing, Other Real Estate, and Wealth Portfolios”

Discussant: R. Glenn Hubbard, NBER and Columbia University

Joseph Gyourko, University of Pennsylvania, and Jaehye Han, Korea Maritime Institute, “Housing Wealth, Housing Finance, and Tenure Choice in Korea”

Discussant: Bertrand Renaud, The World Bank

Brueckner and Follain investigate how the type of mortgage can influence the demand for housing. They show that borrowers with adjustable-rate mortgages (ARMs) consider future mortgage rates in formulating their housing demands, and that ARM borrowers demand more housing than borrowers with fixed-rate mortgages (FRMs) at typical interest rates. Brueckner and Follain conclude that ARMs have raised the level of housing demand and reduced the cyclical variation in new construction.

Goulder examines the consequences of the Tax Reform Act of 1986 for housing markets. He shows that elimination of the investment tax credit and, to a lesser extent, changes in depreciation lives reduce the incentive to invest in corporate plant and equipment but have little impact on housing investment in the short run. However, Goulder predicts that in the long run the tax reform will reduce corporate capital investment and hence national income, thereby reducing housing demand and lowering housing prices.

Mankiw and Weil ask how major demographic changes affect the housing market in the United States. They find that the entry of the baby boom generation into its house-buying years was the major cause of the increase in real housing prices in the 1970s. Since the baby bust generation is entering its house-buying years now, housing demand will grow more slowly in the 1990s than in any time in the past 40 years, they predict. If the historical relationship between housing demand and housing prices continues, then real housing prices will fall substantially over the next two decades.

Hendershott and VanOrder show that the market for FRMs now appears to be fully integrated with other capital markets. This is the result of widespread securitization of mortgages by government-sponsored credit agencies. The authors study the historic time path of a fictional mortgage rate in a perfect capital market (a “Treasury” rate adjusted for the housebuyers’ prepayment option) and compare it with actual mortgage rates. They also estimate how the existence of a perfectly integrated mortgage market (with rates equal to market rates and no credit rationing) would alter residential capital accumulation relative to the historical record.

Manchester and Poterba study the impact of second mortgage borrowing on household net worth. Second mortgages accounted for 10.8 percent of the stock of outstanding mortgage debt at the end of 1987, up from 3.6 percent at the beginning of the 1980s. Manchester and Poterba estimate that on average, households with second mortgages have lower net worth (by 70 cents per dollar of second mortgage) than comparable households without second mortgages. They also conclude that there is \$2.5 trillion of housing equity that could be borrowed against, at tax-deductible interest rates, even with the restrictions on mortgage debt built into the 1986 Tax Reform Act.

Skinner investigated the behavioral impact of the dramatic rise in housing prices during the 1970s. He predicts that if homeowners had consumed even a small fraction of their housing gains, then personal saving

rates would have dropped 40 percent during the 1980s. However, his empirical evidence on whether housing value has a positive effect on consumption is mixed. Hence there is little evidence that the rise in housing prices during the 1970s reduced aggregate nonresidential saving rates.

Ioannides studies the determinants of household portfolio composition with a focus on real estate. Real estate wealth amounts to 42 percent of total privately held wealth (including pension wealth), of which 27 percent is net equity in principal residences. Using data from the 1983 Survey of Consumer Finances, Ioannides shows that as household wealth increases, financial assets and real estate other than principal residences also increase, both absolutely and as shares of net wealth. Net equity in principal residences also increases with wealth, but its share in total wealth decreases with net wealth. Both access to professional investment advice and having accounts with stockbrokers are associated with a lower housing share in total wealth and a higher share of other real estate in total wealth. A willingness to take risks and to remain illiquid increases the shares of financial assets and other real estate and decreases the housing share of total wealth.

Gyourko and Han describe the housing market and housing finance system in Korea and analyze how they affect tenure choice (the decision to buy versus rent a house). The Korean system of housing finance is relatively illiquid, as evidenced by loan-to-value ratios that range from 20 to 40 percent. The amount of personal equity that a household can apply toward housing therefore plays a dominant role in the household's tenure choice. Also, the level of low-cost loan funds available from the Korean Housing Back (KHB) affects tenure decisions. For example, a 5 percent increase in the percentage of KHB funds is associated with a 2 percent higher probability of owning a house.

Also attending the conference were: James R. Barth, Federal Home Loan Bank Board; Martin Feldstein, NBER and Harvard University; and Susan E. Woodward, U.S. Department of Housing and Urban Development.

## International Policy Coordination and Exchange Rate Fluctuations

The NBER held a conference on "International Policy Coordination and Exchange Rate Fluctuations" on October 27-29. William H. Branson, NBER and Princeton University; Jacob A. Frenkel, NBER, University of Chicago, and International Monetary Fund (IMF); and Morris Goldstein, NBER and IMF, organized the following program:

Jacob A. Frenkel, Morris Goldstein, and Paul Robert Masson, NBER and IMF, "International Economic Policy Coordination: Rationale, Mechanisms, and Effects (NBER Working Paper No. 2670)

Discussants: Martin Feldstein, NBER and Harvard University, and William H. Branson

Peter B. Kenen, Princeton University, "The Coordination of Macroeconomic Policies"

Discussants: Richard N. Cooper, Harvard University, and Stanley Fischer, NBER, MIT, and The World Bank

Jeffrey A. Frankel, NBER and University of California at Berkeley, "A Modest Proposal for International Nominal Targeting (INT)"

Discussants: Ralph C. Bryant, The Brookings Institution, and Douglas S. Purvis, Queen's University

Paul R. Krugman, NBER and MIT, "Equilibrium Exchange Rates"

Discussants: C. Fred Bergsten, Institute for International Economics, and Michael L. Mussa, NBER and University of Chicago

Maurice Obstfeld, NBER and University of Pennsylvania, "The Effectiveness of Foreign Exchange Intervention: Recent Experience"

Discussants: John Flemming, Bank of England; Hans Genberg, IMF and Graduate Institute of International Studies (Geneva); and Shuntaro Namba, Bank of Japan

Alberto Giovannini, NBER and Columbia University, and Francesco Giavazzi, NBER and University of Bologna, "Can the EMS Be Exported? Lessons from Ten Years of Monetary Policy Coordination in Europe"

Discussants: Richard C. Marston, NBER and University of Pennsylvania, and Wolfgang Rieke, Deutsche Bundesbank

David I. Folkerts-Landau, IMF, "International Coordination of Financial Policies"

Discussant: Francesco Papadia, Bank of Italy

Kenneth A. Froot, NBER and MIT, "Multinational Corporations, Exchange Rates, and Direct Investment"

Discussant: Geoffrey Carliner, NBER

Frenkel, Goldstein, and Masson discuss the rationale for, and barriers to, coordination; the range and specificity of policies to be coordinated; the frequency of coordination; and the size of the coordinating group. They emphasize the choices of rules versus discretion, single-indicator versus multi-indicator approaches, and hegemonic versus more symmetric systems. Finally, the three authors present some simulations from a global macroeconomic model developed in the IMF.

They explore alternatives that range from "smoothing" rules for monetary and fiscal policy, which imply only minimal international coordination, to more activist "target zone" proposals that place greater restrictions on national authorities in the conduct of monetary and/or fiscal policies. They compare their results to

the actual evolution of the world economy over 1947–87 and suggest that simple, mechanistic rule-based proposals are not likely to lead to improved performance.

Kenen examines two approaches to international policy coordination: the policy-optimizing approach, which treats international coordination as a logical extension of the welfare-maximizing process that many economists use to represent policy formation; and the regime-preserving approach, which treats coordination as an episodic process aimed at defending international institutions and arrangements from various shocks and at producing certain public goods, notably exchange rate stability. He shows that the need for coordination is greater under floating than under pegged exchange rates, a result that challenges the common belief that governments enjoy more autonomy under floating rates. Kenen argues that disagreements about economic objectives and behavior become more important in the context of the regime-preserving approach. For example, disagreements about objectives raise the gains from policy-optimizing coordination but intensify disputes about the benefits and costs of regime-preserving coordination.

Frankel identifies three obstacles to coordination: uncertainty, enforcement, and inflation-fighting credibility. Uncertainty makes it difficult for each country to know what policy changes are in its interest. Enforcement is a problem because each country may benefit in the short run by deviating from an agreement and leaving its trading partners to carry the burden. That problem is particularly serious with uncertainty. For example, a country that commits to a narrow range for the money supply will regret the commitment if there is a shift in velocity. Finally, in the international as in the domestic context, the way to establish inflation-fighting credibility is to precommit to some nominal anchor. Frankel argues that agreeing to target nominal GNP (or, better yet, nominal demand) allows for velocity shifts and other uncertainties more than targeting M1 does.

Krugman first asks how an exchange rate can ever be away from equilibrium. The most important source of disequilibrium is price rigidity in the face of nominal shocks. Although equilibrium models without wage-price rigidities have been fashionable in recent years, Krugman shows that wages and prices indeed are slow to adjust. Some evidence against the importance of nominal shocks actually is evidence of the *slowness* of price adjustment. He then asks whether there are secular trends in real exchange rates and finds that they are weaker than one might suppose: that is, relative purchasing power parity holds surprisingly well over the very long run. Finally, Krugman considers why any current assessment of equilibrium exchange rates is problematic.

Since the September 1985 Plaza Agreement by the Group of Five, there has been a substantial realignment of the exchange rates of industrial countries and intervention in the exchange market on a scale not seen since the early 1970s. Obstfeld looks at the effec-

tiveness of sterilized intervention in the light of recent experience. He concludes that sterilized intervention, in itself, has played a negligible role in exchange rate realignment. The main medium-term policy influences on exchange rates have been clear shifts in monetary and fiscal policies. Over shorter periods, intervention seems to have influenced exchange markets through a signaling channel. This effect has been critically linked to authorities' frequent readiness to adjust monetary policies promptly to counteract undesired pressures in the exchange market. As a result, sterilized intervention cannot be said to have furnished policymakers with an additional, independent instrument. At best, intervention has functioned as a convenient and rapid means of communicating policy intentions with respect to exchange rates.

Giovannini and Giavazzi believe that the European Monetary System (EMS) cannot be copied outside of Europe. The EMS is just one element of a more comprehensive design of institutional integration within Europe: the presence of the European Economic Community (EEC), and the dependence of EEC institutions upon exchange rate stability lend credibility to EMS exchange rate targets in a way that would not exist among the United States, Europe, and Japan. The EMS is similar to previous fixed exchange rate regimes in that it has a leader (deutsche mark) and follower currencies. This suggests that fixed rates per se cannot induce international monetary cooperation. Finally, different uses of the inflation tax among European countries and the divergent behavior of government debt after 1979 indicate that pursuing monetary convergence among countries with different fiscal structures might entail substantial fiscal reforms.

Folkerts-Landau considers the coordination of policies governing domestic and international financial transactions, markets, and institutions. International financial activity denominated in the major currencies has undergone an unprecedented transformation: private market participants increasingly wish to exploit opportunities for arbitraging regulatory and fiscal differences across domestic and international jurisdictions, and to exploit guarantees extended by financial authorities. Such new opportunities were created by the macroeconomic imbalances since the mid-1970s. Folkerts-Landau concludes that the uncoordinated restructuring process in financial markets can lead to inefficiency and instability, since the prevailing process has created incentives for risk-taking by financial intermediaries. Successful coordination of financial policy—involving convergence in regulation, taxes, and guarantees—can avoid such difficulties. The recently concluded Basle Agreement on risk-weighted capital requirements is an example of a successful cooperative approach to financial policy.

Froot examines the potential effects that large international corporations have on exchange rates and international capital flows. He finds that financial market innovations that have affected large corporations have not increased exchange rate volatility. Froot then looks

at how multinationals' international investment activities might affect exchange rates and capital flows. One important route is through capital market imperfections that can create a difference between the cost of capital to certain multinationals and to purely domestic firms. Froot argues that cost-of-capital differentials may help explain international flows of direct investment and that the tax systems in industrialized countries may be an important source of cost-of-capital differentials. Changes in corporate tax codes in the 1980s may have had an impact on U.S. direct investment inflows and outflows. There is little evidence, however, that these capital flows have increased exchange rate volatility.

The volume resulting from this conference also will include a paper by Lois Stekler, Federal Reserve Board, titled "The Adequacy of International Transactions and Position Data for Policy Coordination." This paper examines the global current account discrepancy and the statistical discrepancy in the U.S. international transactions accounts.

The following people also attended the conference: Rudiger Dornbusch, NBER and MIT; Robert E. Lipsey, NBER and Queens College, CUNY; Marcus M. Miller, University of Warwick; and William R. White, Bank of Canada.

## Macroeconomic Policy in the New Era

A symposium on "Macroeconomic Policy in the New Era," jointly hosted by the NBER and the Ministry of Finance, Japan, took place in Tokyo on November 1 and 2. The agenda was:

Koichi Hamada, NBER and Yale University, "The Political Economy of International Economic Coordination"

Alan S. Blinder, NBER and Princeton University, "The Monetary and Fiscal Transition in the United States"

Kazumi Asako, Institute of Fiscal and Monetary Policy, Ministry of Finance, and Yokohama National University, and Satoru Kanoh, Yokohama University, "Objectives and Controllability of Japanese Monetary and Fiscal Policies: 1968-86"

Bennett T. McCallum, NBER and Carnegie-Mellon University, "Targets, Indicators, and Instruments of Monetary Policy"

Takatoshi Ito, NBER, University of Minnesota, and Hitotsubashi University, "Monetary Targeting in Japan: 1975-88"

Hamada discusses a two-stage and two-level game approach to international political economic relations. The choice of a rule (or regime) and the strategic policy interactions under a given rule can be formalized as a two-stage game; similarly, the simultaneous development of international negotiations and domestic economic conflicts (or their resolution) can be formalized as a two-level game.

Blinder argues that the direction of tight monetary policy and loose fiscal policy taken from 1979 to 1986 has been reversed in the past two years. However, the transition toward undoing that policy stance is only half complete. According to Blinder, the total transition will be difficult because the Social Security trust fund is accumulating a large surplus.

Asako and Kanoh estimate how Japanese monetary and fiscal authorities modify their policies in response to six macroeconomic variables. The policy stances are measured by the rise or fall of the official discount rate and the acceleration or delay of public expenditures. Their monetary equation has high predictive power, while their fiscal equation is less precise.

McCallum's paper begins with evidence concerning the merits of the price level, as compared with nominal income, as an intermediate target for U.S. monetary policy. Simulations with four different econometric models indicate greater robustness of performance with the nominal income target. Next, the paper considers recent proposals for policy based on new indicator variables and shows that in fact these variables provide very little incremental information (in addition to that typically used by the monetary authority). Finally, the paper begins an empirical investigation of the possibility of using an interest rate instrument to achieve nominal income targets. Results are not as good as with a monetary base instrument.

Ito shows that the official "forecasts" of money supply growth by the Bank of Japan are not monetary "targets" in the sense of a monetarist rule. His conclusion rests on two pieces of evidence: when there is a surprise in the actual money supply, the next "forecast" is revised to accommodate the actual movement, and not to correct (or compensate) for the surprise; and the forecast errors (actual minus "forecast") are not correlated with the demand shock, as a rigid monetarist rule would predict.



Takatoshi Ito addresses Conference on "Macroeconomic Policy in the New Era" in Tokyo.



# Tax Policy and the Economy

Over 150 members of the business, government, and legal communities attended the NBER's third annual conference on Tax Policy and the Economy in Washington, DC on November 15. The conference was organized by NBER Research Associate Lawrence H. Summers of Harvard University. The following papers were presented:

Martin Feldstein, NBER and Harvard University, and Douglas W. Elmendorf, NBER, "Budget Deficits, Tax Incentives, and Inflation: A Surprising Lesson from the 1983-4 Recovery"

Daniel R. Feenberg, NBER, and Jonathan S. Skinner, NBER and University of Virginia, "Sources of IRA Savings"

John B. Shoven, NBER and Stanford University, "The Japanese Tax Reform and the Effective Rate of Tax on Japanese Corporate Investment" (NBER Working Paper No. 2791)

B. Douglas Bernheim, NBER and Northwestern University, "Incentive Effects of the Corporate Alternative Minimum Tax"

James M. Poterba, NBER and MIT, "Venture Capital and Capital Gains Taxation"

Feldstein and Elmendorf examine the 1983-4 cyclical recovery. They firmly reject the "supply side" explanation of the recovery, which emphasizes the incentive effects of the 1981 tax cuts on labor supply, noting that there were no increases in the labor force participation rate as the economy recovered in 1983 and 1984. They also challenge the often-invoked Keynesian explanation for the recovery, arguing that the economy's turnaround can be explained entirely by monetary variables, not fiscal deficits.

While Feldstein and Elmendorf find that the deficit had very little effect on the growth of nominal GNP, they argue that deficits did have important effects on the composition of nominal GNP between real growth and inflation. Large deficits and potent investment incentives raised real interest rates, attracting foreign capital into the United States and causing the dollar to surge. This in turn reduced the inflation rate and led to a more favorable allocation of nominal GNP growth between real growth and inflation than would have been possible otherwise.

Feenberg and Skinner study the effect of IRAs on personal saving. In 1981, the IRA program was extended with the hope that it would encourage Americans to save more. Although the personal saving rate has not risen since 1981, there remains considerable controversy as to whether IRAs were effective prior to their partial repeal in the 1986 Act. Feenberg and Skinner find that IRA contributors typically increased their asset holdings outside of IRAs also. They report that con-

tributions of \$2000 for couples that legally could contribute more were extremely common. They also note that taxpayers expecting to receive refunds were less likely, other things equal, to make IRA contributions than taxpayers who owed the government money. They conclude that "there is strong evidence that in fact IRA saving does represent new saving."

Shoven summarizes recent tax reform developments in Japan, focusing on incentives for corporate investment. He finds that the proposed changes in the Japanese tax system are at least as significant as those contained in the 1986 U.S. act. He predicts that the introduction of a value-added tax and the elimination of individual saving incentives are likely to increase the perceived fairness of the system. Shoven also anticipates some increase in the tax burden on corporate investment, up to a level slightly lower than the one prevailing in the United States. This is especially likely if Japanese inflation rates remain negligible.

Bernheim addresses the Alternative Minimum Tax (AMT) that was introduced in the 1986 Act. This tax, by falling heavily on certain industries, may undercut tax neutrality and economic efficiency. Bernheim challenges this conclusion, arguing instead that the AMT dovetails well with the rest of the tax system by burdening industries that largely would escape taxation otherwise. A central point of his analysis is that the AMT offsets biases associated with a financing of investment by raising the tax burden on debt-financed investments and lowering it on equity-financed investments. Hence, he finds that it has relatively little effect on weighted average costs of capital.

The AMT also might distort the composition of economic activity by promoting otherwise unprofitable mergers or leasing arrangements. However, Bernheim uses balance sheet data for a large number of industrial firms and finds no evidence bearing out this concern.

Poterba examines various channels through which capital gains taxes influence venture capital. He finds that while funding for new ventures did increase sharply after the 1978 cut in tax rates on capital gains, much of the new money came from pension funds that were not affected by the tax change. The continuing participation of tax-free entities in the venture capital market suggests that taxes were not the dominant factor driving venture funding. In Poterba's view, a more plausible link connects capital gains taxes to entrepreneurs' decisions to start new companies. He notes that because such entrepreneurs often sell out after a few years, the gains from deferral of capital gains taxes are smaller than in the case of some other investments.

Poterba stresses that reductions in the capital gains tax are a very blunt instrument for helping venture capital. Only about 30 percent of taxable capital gains occurs on common stocks. The remainder occur on real estate, partnerships, and other depreciable assets. Furthermore, venture capital represents only a very small proportion of the capital gains realized on common stocks. He estimates that in 1985 and 1986, venture-backed initial public offerings accounted for less than

1 percent of realized capital gains.

The papers presented at this conference will be published by The MIT Press in *Tax Policy and the Economy, Volume 3*. Its availability will be announced in a future issue of the *NBER Reporter*.

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## Conference Calendar

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Each *NBER Reporter* includes a calendar of upcoming conferences and other meetings that are of interest to large numbers of economists (especially in academia) or to smaller groups of economists concentrated in certain fields (such as labor, taxation, finance). The calendar is primarily intended to assist those who plan conferences and meetings, to avoid conflicts. **All activities listed should be considered to be "by invitation only," except where indicated otherwise in footnotes.**

Organizations wishing to have meetings listed in the Conference Calendar should send information, comparable to that given below, to Conference Calendar, National Bureau of Economic Research, 1050 Massachusetts Avenue, Cambridge, MA 02138. Please also provide a short (fewer than fifty words) description of the meetings for use in determining whether listings are appropriate for inclusion. The deadline for receipt of material to be included in the Spring 1989 issue of the *Reporter* is March 1. If you have any questions about procedures for submitting materials for the calendar, please call Kirsten Foss Davis at (617) 868-3900.

**February 10, 1989**

Program Meeting: Economic Fluctuations, NBER

**February 16, 1989**

Conference on International Policy Coordination and Exchange Rate Fluctuations, NBER

**February 23-26, 1989**

Conference on International Aspects of Taxation, NBER

**February 24, 1989**

Program Meeting: Financial Markets and Monetary Economics, NBER

**March 3-4, 1989**

Conference on Strategic Trade Policy, NBER

**March 10-11, 1989**

Annual Conference on Macroeconomics, NBER

**March 14-18, 1989**

Conference on Trade and Development in Sub-Saharan Africa, Center for Economic Policy Research

**March 16-17, 1989**

Conference on North-South Integration in an Enlarged European Community, Center for Economic Policy Research

**March 16-17, 1989**

Conference on Primary Commodity Prices: Economic Models and Economic Policy, Center for Economic Policy Research

**March 16-19, 1989**

Stock Market Volatility and the Crash, NBER

**March 30-31, 1989**

Second Annual Interamerican Seminar on Macroeconomics, NBER

**April 6-7, 1989**

Panel Meeting on Economic Activity, Brookings Institution

**April 20-21, 1989**

Economic Policy Panel Meeting, Center for Economic Policy Research

**April 21-22, 1989**

Conference, Carnegie-Mellon University-University of Rochester

**April 28-29, 1989**

Universities Research Conference: Social Insurance, NBER\*

**May 11-12, 1989**

Program Meeting: Labor Studies, NBER

**June 10-11, 1989**

Far Eastern Meeting, Econometric Society

**June 15-June 17, 1989**

Conference on Capital Markets and Debt Management, Center for Economic Policy Research/Italian Macroeconomic Policy Group

**June 19-20, 1989**

International Seminar on Macroeconomics, NBER

**June 21-24, 1989**

North American Summer Meeting, Econometric Society

**June 26-29, 1989**

European Research Workshop on International Trade, Center for Economic Policy Research/Centre for Applied Research, Bergen

**June 27-29, 1989**

Conference on Public Finance, NBER

**July 13-15, 1989**

Australasian Meeting, Econometric Society

**August 1, 1989**

Latin American Meeting, Econometric Society

**August 6-10, 1989**

Joint Statistical Meetings, American Statistical Association\*

**September 4-8, 1989**

European Meeting, Econometric Society

**September 13-15, 1989**

Conference on Mismatch and Labor Mobility, Center for Economic Policy Research

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

**September 14-15, 1989**

Panel Meeting on Economic Activity, Brookings Institution

**September 17-20, 1989**

Annual Meeting, National Association of Business Economists\*

**October 4-7, 1989**

19th (Biannual) Conference, Center for International Research on Economic Tendency Surveys

**October 8-11, 1989**

82nd Annual Conference, National Tax Association-Tax Institute of America\*

**October 19-20, 1989**

Conference on the United States and Japan in the 1990s, NBER

**November 3-4, 1989**

Conference on Research in Income and Wealth: International Studies, NBER

**November 19-21, 1989**

Annual Meeting, Southern Economic Association\*

**November 30-December 2, 1989**

Conference on the Economics of Art Museums, NBER

**December 14-15, 1989**

Micro Brookings Panel on Economic Activity Conference, Brookings Institution

**February 15-17, 1990**

U.S.-Japan Young Leaders' Conference, NBER

**April 5-8, 1990**

Conference on Aging, NBER

**September 23-26, 1990**

Annual Meeting, National Association of Business Economists\*

**October 18-21, 1990**

Conference on American Economic Policy, NBER

**March 21-24, 1991**

Conference on Economic Crisis, NBER

**September 22-25, 1991**

Annual Meeting, National Association of Business Economists\*

**September 15-18, 1992**

Annual Meeting, National Association of Business Economists\*

**September 19-23, 1993**

Annual Meeting, National Association of Business Economists\*

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

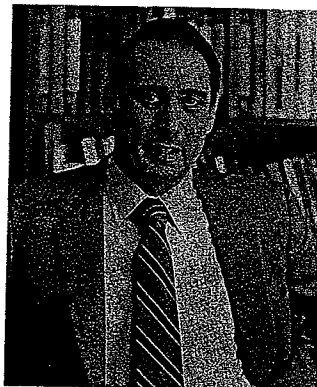
# Bureau News

## New Directors Named

The NBER's Board of Directors elected four new members at its September meeting: William C. Brainard, representing Yale University; Bruce Gardner, American Agricultural Economics Association; Ben Laden, National Association of Business Economists (NABE); and Leo Melamed, to serve as a Director-at-Large.

Brainard is the Frederick W. Beinecke Professor of Economics at Yale University. He received his B.A. from Oberlin College and his M.A. and Ph.D in economics from Yale, where he has been a faculty member since 1962. He also served as provost of the university from 1981-6.

Gardner is a professor in the Department of Agricultural and Resource Economics at the University of Maryland. He also has taught at North Carolina State University and Texas A&M University, and was a senior staff economist on the President's Council of Economic Advisers from 1975-7. He received his Ph.D. from the University of Chicago.



William C. Brainard



Bruce Gardner



Ben Laden



Leo Melamed

Laden, a partner of Maryland Capital Management, is a past president of the NABE. He received his Ph.D. in economics from John Hopkins University. From 1971-4, Laden was an economist with the Federal Re-

serve Board. He became vice president and chief economist of T. Rowe Price Associates in 1974 and left in 1987 to head his own firm, Ben E. Laden Associates.

Melamed, an attorney, is chairman of the executive committee and special counsel to the Board of Governors of the Chicago Mercantile Exchange. Widely recognized as the founder and architect of financial futures, he is an active futures trader and chairman of Dellsher Investment Company. Melamed received his J.D. from the John Marshall Law School (Chicago).

At the same meeting of the NBER's Board, four new members of the Executive Committee were chosen: John Biggs, Kathleen B. Cooper, George C. Eads, and George Hatsopoulos.

## Olin Fellowships Announced

The four NBER Olin Fellows for 1989-90 are: Alberto F. Alesina, Alan B. Krueger, Karen K. Lewis, and David S. Scharfstein. Olin Fellows spend one year at the NBER's Cambridge office doing empirical research and are free of all teaching and university responsibilities during that year. The Fellows Program is made possible by a grant from the John M. Olin Foundation.

Alesina teaches at Harvard University; his research will focus on the effect of political institutions on monetary and fiscal policies. Krueger, who teaches at Princeton University, will examine workers' compensation and public sector employment. Lewis, who comes to the NBER from New York University's School of Business Administration, will study exchange rate fluctuations. Scharfstein, who is on the economics faculty of MIT's Sloan School of Management, will investigate Japanese corporate structure and investment.

## 1988 Summer Institute

Over 400 economists from 112 universities and organizations around the world attended the NBER's Tenth 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 General Electric Foundation and the National Science Foundation. There were 24 separate workshops on topics including asset prices, credit markets, corporate finance and taxation, international aspects of taxation, labor markets and the macro economy, real and nominal factors underlying the business cycle, output and price measurement, R and D investment and productivity growth, and models of price rigidity. A catalog of all papers and work in progress discussed at the Summer Institute can be obtained by writing to: Summer Institute Catalog, NBER, 1050 Massachusetts Avenue, Cambridge, MA 02138.

## Bureau Researcher to Head CEA

Michael J. Boskin, a member of the NBER's Program in Taxation and head of the Bureau's Palo Alto office, has been nominated chairman of the President's Council of Economic Advisers.

Boskin received his B.A. and Ph.D. from the University of California at Berkeley. He has taught economics at Stanford University since 1971 and has written extensively about Social Security, saving, the federal budget, and taxes. Boskin has been a research associate of the NBER since 1977.

## Economic Fluctuations Research Meeting

On October 14, over 50 members and guests of the NBER's Program in Economic Fluctuations met in Cambridge. Organizers Andrew B. Abel, NBER and University of Pennsylvania, and Paul M. Romer, NBER and University of Rochester, planned the program:

Michael Woodford, University of Chicago, "Self-Fulfilling Expectations and Fluctuations in Aggregate Demand"

Discussant: Russell Cooper, NBER and University of Iowa

John H. Cochrane, University of Chicago, "Production-Based Asset Pricing: Using Producers' First-Order Conditions to Link Asset Prices to Macroeconomic Fluctuations"

Discussant: Gregory Huffman, University of Western Ontario

Jeremy I. Bulow, NBER and Stanford University, and Kenneth Rogoff, NBER and University of Wisconsin, "The Buyback Boondoggle"

Discussant: Jeffrey D. Sachs, NBER and Harvard University

Narayana R. Kocherlakota, Northwestern University, "Evaluating Policy Innovations Using Vector Autoregressions and Structural Methods"

Discussant: Lawrence J. Christiano, Federal Reserve Bank of Minnesota

Robert E. Hall, NBER and Stanford University, "Increasing Returns: Theory and Measurement with Industry Data"

Discussant: Matthew D. Shapiro, NBER and Yale University

Takeo Hoshi, University of California, San Diego; Anil Kashyap, Board of Governors of the Federal Reserve System; and David Scharfstein, MIT, "Corporate Structure, Liquidity, and Investment: Evidence from Japanese Panel Data"

Discussant: Mark Gertler, NBER and University of Wisconsin

Woodford investigates the possibility that exogenous fluctuations in expectations—what Keynes called “animal spirits”—are an important driving force in the business cycle. He emphasizes that shifts in expectations may not be irrational even if they are not justified by shifts in underlying conditions because changes in expectations can be self-fulfilling. For example, expectations of rising aggregate demand may lead firms to increase investment spending, which in turn will produce the expected high demand.

Cochrane investigates the relationship between asset prices and aggregate output, investment, and other macroeconomic variables. In particular, he explores the links implied by producers' first-order conditions (essentially the relationship of asset prices to marginal rates of transformation over time). This methodology is a departure from the usual approach of linking asset prices to fluctuations in aggregate consumption via consumers' first-order conditions. Cochrane's approach helps to explain the size of the equity premium and the cyclical behavior of the term structure of interest rates.

Bulow and Rogoff argue that highly indebted countries provide a “boondoggle” to creditors when they retire highly discounted debt through buybacks of debt-equity swaps. When a country buys back “marginal debt,” it pays the full market price—the price of “average debt”—even though the marginal debt will yield benefits only if the entire debt eventually is repaid. In addition, in contrast to the case of a domestic borrower, a sovereign government engaged in a debt repurchase generally does not reduce the collateral that could be seized in the event of a default on the rest of the debt. Bulow and Rogoff illustrate these points with a discussion of recent debt buybacks by Bolivia and Mexico.

Kocherlakota criticizes the common view that structural models provide more accurate predictions of the effects of policy changes than vector autoregressions (VARs) do. He shows that both the structural and the VAR approaches require restrictions on the parameters of the economy that cannot be tested, and that the restrictions of the VAR approach may be weaker. He concludes that the true advantage of the structural approach is that gathering data from different policy regimes can lead to more precise predictions, while the additional data do not help a VAR econometrician.

Hall seeks to explain the finding that firms in many U.S. industries have market power, in the sense that their price exceeds their marginal cost. One possibility is that firms have monopoly power because of restrictions on entry, and thus they earn monopoly profits. An alternative is that entry is free, but that firms incur fixed costs, so that equilibrium involves enough market power to cover these costs. Hall favors the second explanation that does not involve monopoly profits. He also estimates the returns to scale in U.S. industries

and finds that elasticities of output with respect to total input are greater than three in many industries.

Hoshi, Kashyap, and Scharfstein use Japanese data to show that information and incentive problems in the capital market affect investment. They compare the determinants of investment for two kinds of Japanese firms: those with close ties to large banks that stand ready to finance investment, and others without such ties that presumably face greater information and incentive problems in obtaining funds. For the firms with links to banks, Tobin's  $q$  is an important determinant of investment while liquidity is not. The reverse is true for firms without links to banks.

## Financial Economists Hold Fall Meeting

Members and guests of the NBER's Program in Financial Markets and Monetary Economics met in Cambridge on November 4. Program Director Benjamin M. Friedman of Harvard University organized the following agenda:

Zvi Bodie, NBER and Boston University, “Inflation, Index-Linked Bonds, and Asset Allocation” (NBER Working Paper No. 2793)

Discussant: Carliss Baldwin, NBER and Harvard University

Bruce N. Lehmann, NBER and Columbia University, “Mean-Variance Efficiency Tests in Large Cross Sections”

Discussant: Gary Chamberlain, NBER and Harvard University

Robert F. Engle III, NBER and University of California at San Diego (jointly with Takatoshi Ito and Wen-Ling Lin), “Meteor Showers or Heat Waves? Heteroskedastic Intradaily Volatility in the Foreign Exchange Market” (NBER Working Paper No. 2609)

Discussant: Andrew Lo, NBER and MIT

Alan J. Auerbach, NBER and University of Pennsylvania, and Kevin Hassett, University of Pennsylvania, “Corporate Savings and Shareholder Consumption”

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

Stewart C. Myers, NBER and MIT, “Signaling Models of Accrual Accounting”

Discussant: Jeremy I. Bulow, NBER and Stanford University

Bodie discussed the recent introduction by several U.S. financial institutions of bonds linked to the consumer price index (CPI). For investors, the main value of these bonds is as a hedge against changes in long-term real interest rates. CPI-linked bonds also make

possible the creation of additional financial innovations that would use them as the asset base. One such likely innovation is inflation-protected retirement annuities. The lack of indexation has long been viewed as a major shortcoming of conventional pension plans, and the introduction of index-linked bonds eliminates one of the main obstacles to indexed private pensions.

Lehmann notes that all mainstream theories of asset pricing predict that some portfolio is mean-variance efficient; tests for mean-variance efficiency ask whether *particular* costless zero beta portfolios have zero expected returns. All existing test procedures translate existing statistical procedures to the asset pricing context. Conventional methods require that there be fewer assets under study than there are time-series observations on the returns. This constraint has resulted in the common practice of grouping the available universe of securities, which number in the thousands, into a smaller number of portfolios. This practice is fraught with hazard because there are a priori theoretical reasons for thinking that grouping dramatically reduces the power of tests, specifically in the asset pricing theory context. Lehmann exploits the portfolio-based intuition. He constructs costless portfolios with approximately zero betas based on previous period estimates of the mean returns and betas of individual securities. The tests are easy to apply and interpret since they reflect the returns to portfolio strategies that could have been followed by actual investors. The new procedures also appear to be more powerful than conventional tests based on grouped portfolios.

Engle, Ito, and Lin define and test a form of market efficiency called market dexterity. It requires that asset prices adjust instantaneously and completely in response to new information. They examine the behavior of the yen/dollar exchange rate, while each of the world's major markets is open, in order to test for informational effects from one market to the next. Assuming that news has only country-specific autocorrelation (like a heat wave), any intradaily volatility spillovers (meteor showers) become evidence against market dexterity. Statistical tests lead the authors to reject the heat wave theory and therefore the market dexterity hypothesis.

Auerbach and Hassett observe that the relationship between corporate and individual saving is important but not understood well. For example, a common view holds that a shift in the overall tax burden from individuals to corporations will reduce private saving, as induced reductions in corporate saving are offset only partially by increased household saving. This outcome often is expressed in terms of households' failure to "pierce the corporate veil"—that is, their failure to take full account of the behavior of corporations whose shares they own in determining their own behavior. Auerbach and Hassett argue that there may be many reasons why changes in the level of corporate saving *ought* to be associated with changes in the level of private saving, because of effects on the level or distribution of wealth, for example. Empirical tests of shareholders'

ability to pierce the corporate veil should attempt to control for such effects, although no previous tests seem to have done so effectively. Auerbach and Hassett's tests suggest that, holding aggregate wealth constant, changes in corporate saving do not affect household consumption behavior and hence do not influence private saving.

Myers presents a signaling model that explains why accrual accounting is needed even when the stock market is efficient. The heart of the problem is investors' inability to distinguish cash outlays for operating costs from outlays for investment. Managers are concerned with current stock price as well as with intrinsic value, and thus are tempted to reduce investment in order to pretend to have lower operating costs. In the end, investors learn true operating costs, but firms must underinvest to maintain their place in the signaling equilibrium. This underinvestment problem is most serious with pure cash flow accounting. Accrual accounting by prespecified rules reduces the degree of underinvestment. Thus managers and investors are rationally concerned with reported book earnings, and book earnings convey information not contained in reported cash flow.

Also attending the meeting were: Alberto Alesina, James H. Stock, and Phillippe Weil, NBER and Harvard University; Michael D. Bordo, NBER and University of South Carolina; Willem H. Buiter, NBER and Yale University; Stephen G. Cecchetti, NBER and Ohio State University; Richard H. Clarida, R. Glenn Hubbard, and Frederic S. Mishkin, NBER and Columbia University; Zhang Fengbo, State Council of China; Kenneth A. Froot, Robert S. Pindyck, and James M. Poterba, NBER and MIT; Alex Kane and Michael Rothschild, NBER and University of California at San Diego; Miles S. Kimball and Jeffrey A. Miron, NBER and University of Michigan; Anna J. Schwartz, NBER; Guido Tabellini, University of California at Los Angeles; Kenneth D. West, NBER and University of Wisconsin; and Stephen P. Zeldes, NBER and University of Pennsylvania.

## Labor Economists Meet

About 30 members and guests of the NBER's Program in Labor Studies met in Cambridge on November 18. Program Director Richard B. Freeman, of Harvard University, organized this agenda:

John Bound, NBER and University of Michigan, and Alan B. Krueger, NBER and Princeton University, "The Extent of Measurement Error in Longitudinal Earnings Data: Do Two Wrongs Make a Right?"

Sanders Korenman, Princeton University, and David Neumark, Federal Reserve Board, "Is Superwoman a Myth? Marriage, Children, and Wages"

Joseph S. Tracy, NBER and Yale University, and Joseph Gyourko, University of Pennsylvania, "Public Sector Bargaining and the Local Budgetary Process"

Kevin M. Murphy, NBER and University of Chicago, and Finis Welch, University of California, Los Angeles and Unicon Research Corporation, "Wage Differentials in the 1980s: The Role of International Trade"

By comparing earnings reported by individuals in the Current Population Survey (CPS) to earnings reported by those individuals' employers to the Social Security Administration, Bound and Krueger find that 68-78 percent of the variations in the growth of the men's earnings and 81-85 percent of the variations in the growth of women's earnings in two consecutive years are accurate. Comparing earnings reported in a given year, Bound and Krueger find that interpersonal variations are even more accurate. They conclude that CPS data are more reliable than was believed previously. It seems that individuals who overreport their earnings in surveys in one year are likely to overreport them the following year as well. Also, low-income people tend to overreport their earnings while high-income people tend to underreport their earnings in government surveys. On the other hand, errors in reporting are correlated only slightly with such individual characteristics as age and education. Finally, Bound and Krueger find that earnings data tend to be more accurate for women than for men, and that this is not because women are more likely to answer surveys themselves than men are.

Do household responsibilities reduce the wages of married women relative to men or to single women with comparable education and training? Korenman and Neumark find no consistent negative relationship between women's wages and marriage, but they do find a negative association between women's wages and motherhood. However, women who continue to work outside the home (or return to work quickly) after marriage or the birth of a child suffer no wage loss compared to similar never-married or childless women.

Tracy and Gyourko find that duty-to-bargain laws, especially when backed up with access to strikes or arbitration, significantly increase the wages of teachers, police, and firemen. For teachers, these laws also decrease employment. Limits on property tax rates reduce the wages of teachers and firemen. Reducing the degree of monopsony power in the local labor market is associated with higher wages and employment levels for each category of public workers. Finally, Tracy and Gyourko find that cities with a city manager form of government have higher wages and lower employment for police and firemen but are no different than other cities for teachers.

Murphy and Welch document a major change in the wage structure in the United States: an increase in the premium paid to recent college graduates over recent high school graduates. The decline in the college premium in the 1970s was reversed completely in the 1980s

and for some groups the premium rose to new peaks. The changes in labor demand for workers with different years of schooling may be linked to trade deficits. Murphy and Welch find that the increased trade deficit between 1979 and 1986 reduced the demand for male high school graduates relative to male college graduates. Apparently, imports substitute for less-educated male labor and complement more-educated male labor, thus inducing a shift in the relative demand for each. If this explanation of the rising college premium is correct, then a decline in trade deficits will go a long way toward improving the relative earnings of men with a high school education or less.

## Reprints Available

The following NBER Reprints, intended for nonprofit education and research purposes, are now available. (Previous issues of the *NBER Reporter* list titles 1-1042 and contain abstracts of the Working Papers cited below.)

These reprints are free of charge to corporate associates and other sponsors of the National Bureau. For all others there is a charge of \$2.00 per reprint to defray the costs of production, postage, and handling. Advance payment is required on orders totaling less than \$10.00. Please do not send cash. Reprints must be requested by number, in writing, from: Reprint Series, National Bureau of Economic Research, 1050 Massachusetts Avenue, Cambridge, MA 02138.

1043. "The Assessment of National Price Levels," by Irving B. Kravis and Robert E. Lipsey, 1987 (NBER Working Paper No. 1912)
1044. "Short-Term and Long-Term Expectations of the Yen/Dollar Exchange Rate: Evidence from Survey Data," by Jeffrey A. Frankel and Kenneth A. Froot, 1987 (NBER Working Paper No. 2216)
1045. "The Dollar and Real Interest Rates," by John Y. Campbell and Richard H. Clarida, 1987 (NBER Working Paper No. 2151)
1046. "International Capital Flows and Domestic Economic Policies," by Jeffrey A. Frankel, 1988 (NBER Working Paper No. 2210)
1047. "Recent Estimates of Time Variation in the Conditional Variance and in the Exchange Risk Premium," by Jeffrey A. Frankel, 1988 (NBER Working Paper No. 2367)
1048. "Optimal Liability When the Injurer's Information About the Victim's Loss Is Imperfect," by A. Mitchell Polinsky, 1987 (NBER Working Paper No. 2174)



1049. "Political versus Currency Premia in International Real Interest Differentials: A Study of Forward Rates for 24 Countries," by Jeffrey A. Frankel and Alan T. MacArthur, 1988 (NBER Working Paper No. 2309)
1050. "Real-Financial Linkages among Open Economies: An Overview," by Sven W. Arndt and J. David Richardson, 1987 (NBER Working Paper No. 2230)
1051. "Money and the Consumption Goods Market in China," by Richard Portes and Anita Santorum, 1987 (NBER Working Paper No. 2143)
1052. "Successful Adjustment in a Multisectorial Economy," by Joshua Aizenman, 1988 (NBER Working Paper No. 2202)
1053. "Desirability of a Currency Appreciation, Given a Contractionary Monetary Policy and Concave Supply Relationships," by Jeffrey A. Frankel, 1988 (NBER Working Paper No. 1110)
1054. "Effects of Alcoholic Beverage Prices and Legal Drinking Ages on Youth Alcohol Use," by Douglas Coate and Michael Grossman, 1988 (NBER Working Paper No. 1852)
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73. "Test for Unit Roots: A Monte Carlo Investigation," by G. William Schwert, December 1988 (JEL No. 211)

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Two of the four volumes reporting on the NBER's Project on Developing Country Debt, edited by Jeffrey D. Sachs, are now available from the University of Chicago Press. *Developing Country Debt and the World Economy* is nontechnical, and presents condensed versions of the eight country studies and eight papers on the international financial system that were written for this project. It should appeal to anyone interested in the developing country debt problem and could be a useful classroom tool. It is priced at \$50 for the cloth-bound edition and \$16.95 for the paperback.

*Developing Country Debt and Economic Performance, Volume 1: The International Financial System* focuses on the international financial system as a whole. Its eight papers look at: the history of international lending and its implications for reform of the current system; alternative designs for stabilization programs; problems of debtor countries in adjusting to the debt crisis; and the financial institutions in developed countries. This book should interest economists in government (of lending or borrowing countries), banks, international financial institutions, and universities. Since one of the papers was written by political scientists and looks at the political obstacles to adjustment strategies, this volume also should appeal to political scientists and others interested in the political economy of developing countries. The price is \$45.

Volumes 2 and 3, containing the eight in-depth studies of debtor countries, are scheduled for publication this spring.

Sachs, editor of this series and director of the debt project, is a research associate in the NBER's Program in International Studies and a professor of economics at Harvard University.

## The Economics of Aging

*The Economics of Aging*, edited by David A. Wise, is available now from the University of Chicago Press at a cost of \$56. This volume considers the housing mobility and living arrangements of the elderly, their labor force participation and retirement, and their financial status.

This volume reports that wealthier households are less likely to move than poorer households are. Changes in family composition or retirement status increase the likelihood of moving. Moving greatly increases the percentage of income spent on housing. Finally, reverse mortgage annuities are unlikely to increase the income of the poor elderly.

The chapters on retirement and financial status report strong pension incentives to retire at age 55 and penalties for those who work past 65; surprisingly accurate forecasts by individuals about the timing of their retirement; little or no assistance from children for a significant minority of the elderly in need; and that elderly women are likely to become poor when their husbands die and they lose their husbands' pensions.

Finally, smoking has a high cost in terms of potential Social Security benefits that are lost because smokers tend to die younger.

Wise is an NBER research associate and the John F. Stambaugh Professor of Political Economy at the John F. Kennedy School of Government, Harvard University.

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## Current Working Papers

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*Journal of Economic Literature* (JEL) subject codes,

when available, are listed after the date of the Working Paper. Abstracts of all Working Papers issued since September 1988 are presented below. For previous Working Papers, see past issues of the *NBER Reporter*. The 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. Working Papers are not reviewed by the Board of Directors of the NBER.

### **Independent R and D Project Data and Theories of R and D Investment**

**Frank R. Lichtenberg**  
Working Paper No. 2720  
September 1988  
JEL No. 621

This paper analyzes data on a large sample of research and development projects documented in the Defense Department's Independent R and D Data Bank. I hope to provide some stylized facts about R and D investment at the project level and to test the implications of a control-theoretical model developed by Grossman and Shapiro. I calculate moments of the marginal distributions and elasticities of cost with respect to time, by type of project (for example, basic research, or development), and discriminate between alternative hypotheses concerning the shape of the hazard function of R and D investment. Consistent with the major implication of the Grossman-Shapiro model, the rate of investment in a project tends to increase as the project approaches completion.

### **Real and Monetary Determinants of Real Exchange Rate Behavior: Theory and Evidence from Developing Countries**

**Sebastian Edwards**  
Working Paper No. 2721  
September 1988  
JEL Nos. 400, 410

This paper develops a dynamic model of real exchange rate (RER) behavior in developing countries. I assume an economy with three goods (exportables, importables, and nontradables). Residents hold domestic and foreign assets, and there is a regime with dual exchange rates. The government consumes importables and nontradables. There is a distinction between equilibrium and disequilibrium movements of the RER. I study the determinants of RER misalignment with emphasis on the role of devaluations and

balance-of-payments crises. I test the implications of the model using data for 12 developing countries. The results are generally favorable to the model. I also analyze the issue of RER stationarity.

### **Industrial Organization and Product Quality: Evidence from South Korean and Taiwanese Exports**

**Dani Rodrik**  
Working Paper No. 2722  
September 1988  
JEL No. 400

This paper focuses on the relationship between domestic market structure and export performance. It evaluates the hypothesis that more concentrated industrial sectors can achieve the transition from standardized, labor-intensive manufactures to sophisticated skill-intensive products more easily, because such industries are better able to cope with the inevitable reputational externalities involved in producing high-quality goods for foreign markets. South Korea and Taiwan provide a good test of the theory, as they have sharply different market structures. The results of the empirical analysis strongly support the hypothesis.

### **The Case of the Vanishing Revenues: Auction Quotas with Oligopoly**

**Kala Krishna**  
Working Paper No. 2723  
September 1988  
JEL No. 422

This paper examines the effects of auctioning quota licenses when there is market power. The overall conclusion is that with oligopolistic markets, quotas are unlikely to dominate free trade, even when set optimally and with quota licenses auctioned off. Moreover, auction quotas only strictly dominate giving away licenses that are competitively traded if the quota is quite restrictive.

When there is a foreign duopoly or oligopoly and domestic competition, such sales of licenses do not raise revenues unless they are quite restrictive.

I explore an oligopoly example to study the role of product differentiation, demand conditions, and market conditions in determining the value of a license and the welfare effects of auctioning quotas. In this example, auction quotas are always worse than free trade.

Finally, when there is a home duopoly and foreign competition, the price of a quota license is positive when the home and foreign goods are substitutes but is zero when they are complements.

## **Specialization, Transactions Technologies, and Money Growth**

**Harold Cole and Alan C. Stockman**

Working Paper No. 2724

September 1988

JEL No. 310

With some models of money and a representative agent, there is no reason for monetary trade because identical individuals can consume their own production. To avoid this problem, Lucas proposed a parable involving differentiated products in a cash-in-advance model. This paper studies Lucas's suggestion by developing a differentiated product model with money, a cash-in-advance constraint for market purchases, and endogenous specialization. Individuals who are identical *ex ante* choose to differ *ex post* in equilibrium. Monetary exchange involves differentiated goods at a point in time, so a nonzero balance of trade is not a prerequisite for a monetary equilibrium. In contrast to the results in some other models, consumption of goods that are not purchased with money (analogous to leisure services or credit goods) can either rise or fall with a rise in the money growth rate. Finally, we allow for costly barter and examine individuals' choices of the method of payment. We discuss the implied nominal-interest elasticities of the (real) demand for money in the general equilibrium.

## **Fiscal Deficits and Relative Prices in a Growing World Economy**

**Maurice Obstfeld**

Working Paper No. 2725

October 1988

JEL No. 431

This paper analyzes how fiscal disturbances are transmitted among countries and how they affect worldwide capital intensity in a context of growth. The model allows for the production of both nontradable and relatively capital-intensive tradable goods. Factor markets appear to be a major channel for the transmission of fiscal policy shocks to world interest rates, private saving decisions, and ultimately to global asset supplies and their distribution among countries.

The model also illustrates how changes in public debt ratios and shifts in government spending patterns affect resource allocation and welfare. For example, an increase in a small country's per capita public debt leads to the long-run crowding-in of capital and the impoverishment of future generations. A similar policy shift by a large country crowds out capital on a global scale, impoverishes future domestic generations, and has ambiguous effects abroad.

## **Trade Dependency, Bargaining, and External Debt**

**Joshua Aizenman**

Working Paper No. 2726

October 1988

JEL No. 400

This paper analyzes the factors that determine the effective payment on outstanding debt in the presence of partial defaults and the feasibility of renewed investment. I show that the bargaining outcome that determines the repayment is dictated by trade dependency as measured by the substitutability of domestic and foreign products. Relatively larger sectors with lower substitutability between domestic and foreign products will increase the nation's dependency, reduce its bargaining power, and thereby increase the resource transfer ceiling. That increase in the ceiling makes the nation less risky and increases creditors' willingness to lend. Thus, while a strategy of outward growth increases trade dependency, it also increases the availability of external finance. Even with a partial default, investment in sectors that are highly dependent on trade and highly productive may be warranted. This investment can be implemented by a marginal relief of the present debt service in exchange for investment in the proper sector. Following such a scheme may require a detailed conditionality as well as careful monitoring. Direct investment can partially overcome some of the monitoring problems.

## **The Effect of Information Releases on the Pricing and Timing of Equity Issues: Theory and Evidence**

**Robert Korajczyk, Deborah Lucas, and Robert L. McDonald**

Working Paper No. 2727

October 1988

JEL Nos. 313, 520

This paper develops a formal model of the timing and pricing of new equity issues under the assumption that managers are better informed than new investors about the quality of the firm. Firms will prefer to issue equity when the market is most informed about their quality. This implies that equity issues tend to follow information releases, such as earnings announcements. The model also predicts a relationship between the timing and the pricing of equity issues. At the time of the equity issue announcement, the drop in price should increase with the time since the last information release (that is, the longer it has been since the last release, the larger the drop in price will be). At the issue date, the

price drop also should increase with the time since the last information release or issue announcement. We test these predictions on a sample of NYSE, AMEX, and OTC firms that issued equity in 1978-83. We find that there is a clustering of equity issues following earnings announcements and annual reports and that the price drop at the time of the equity issue does increase with the time since the announcement of the issue.

### **Labor and Transfer Incomes and Older Women's Work: Estimates from the United States**

**Philip de Jong, Robert Haveman, and Barbara Wolfe**  
Working Paper No. 2728  
October 1988

This paper analyzes how labor and transfer incomes determine the labor force participation of older women. It examines how women aged 48-62 respond to the level of income available from both work and public transfer programs in deciding whether or not to work. We focus on whether the availability and generosity of disability-related transfers affects the labor supply of these women. We estimate a maximum-likelihood model separately for heads of household and wives. Our results suggest that income opportunities only have a significant effect on the work choices of wives. The response to the availability and generosity of public transfers is largest among older, disabled women who have low expected earnings.

### **U.S. International Capital Flows: Perspectives from Rational Maximizing Models**

**Robert J. Hodrick**  
Working Paper No. 2729  
October 1988

This paper examines several aspects of the debate about the causes of the U.S. current account deficit in the 1980s. It surveys several popular explanations before developing two theoretical models of international capital flows. The first model is Ricardian, and it extends the analysis of Stockman and Svensson (1987). The second model is an overlapping-generations framework. The major difference in predictions of these two models involves the effects of government budget deficits on the exchange rate and the current account. An update of the empirical investigation of Evans (1986) suggests that his vector autoregression methodology is completely uninformative with additional data. I also present some empirical results on the importance of risk aversion in modeling international capital market equilibrium.

### **The Sensitivity of Tests of the Intertemporal Allocation of Consumption to Near-Rational Alternatives**

**John H. Cochrane**  
Working Paper No. 2730  
October 1988

This paper calculates the utility cost to consumers of following alternative decision rules for allocating consumption purchases over time, including excess versus inadequate sensitivity to changes in income and interest rates, and ignoring relevant information. The costs of large deviations from the optimal decision rule—for example, consumption equal to current income—range from 1¢ to \$1 per calendar quarter. This suggests that tests of the theory of optimal intertemporal consumption decisions are not robust to small inaccuracies of modeling, including small costs of transactions and information, and that those costs can explain rejection of the theory as it is applied to aggregate U.S. data.

### **Inflation, External Debt, and Financial Sector Reform: A Quantitative Approach to Consistent Fiscal Policy with an Application to Turkey**

**Ritu Anand and Sweder J. G. van Wijnbergen**  
Working Paper No. 2731  
October 1988

This paper presents and applies an integrated framework for assessing the consistency between fiscal deficits and other macroeconomic targets, such as output growth or the rate of inflation. The model centers around the government budget constraint and can be used either to derive "the financeable deficit" with specific inflation targets, or to derive an equilibrium inflation rate for which no financial adjustment would be necessary. The financeable deficit is the deficit that does not require more financing than is compatible with sustainable external and internal borrowing and existing targets for inflation and output growth. The model can assess the impact on the relationship between fiscal adjustment and sustainable inflation rates of: financial sector reforms affecting base money demand; changes in interest rates paid on foreign and domestic public sector debt; output growth targets; and exchange rate policy. Further, the analysis incorporates an approach to the derivation of a sustainable external debt policy attributable to Cohen (1986). Finally, the model can be used to see what happens if the required fiscal adjustment is postponed. We explore two alternatives: one in which fiscal adjustment takes place eventually, and one in which the inflation tax eventually is used to close any financing gap. The model is applied to an analysis of inflation, external debt, and financial sector reform in Turkey.

## **Technical Change, Learning, and Wages**

**Ann P. Bartel and Frank R. Lichtenberg**

Working Paper No. 2732

October 1988

JEL Nos. 824, 621

This paper examines the relationship between technological change and wages using pooled cross-sectional, industry-level data and several alternative indicators of the rate of introduction of new technology. Our main finding is that industries with a high rate of technical change pay higher wages to workers of any given age and education than less technologically advanced industries do. This is consistent with the notion that the introduction of new technology creates a demand for learning, that learning is a function of employee ability and effort, and that increases in wages are required to elicit increases in ability and effort. Relatedly, we find that the wages of highly educated workers (especially recent graduates) relative to those of less educated workers are highest in technologically advanced industries; this is consistent with the notion that educated workers are better learners.

## **Are Estimated Tax Elasticities Really Just Tax Evasion Elasticities? The Case of Charitable Contributions**

**Joel B. Slemrod**

Working Paper No. 2733

October 1988

JEL No. 321

Tax return data, which have been a principal source for econometric investigations of the behavioral response to tax policy, are subject to misreporting that may bias estimates of tax responsiveness. The misreporting arises because understatement of taxable income itself may be a function of an individual's marginal tax rate, or the return to a dollar of understated taxable income. To the extent that misreporting of income and deductions is a function of the same factors that determine the behavior under study, estimated relationships based on reported data will reveal a composite of the tax (and income) responsiveness of the actual behavior and of the misreporting of the behavior.

This paper uses data from tax returns that have been subject to intensive audits to confront the quantitative importance of misreporting for the estimated tax responsiveness of charitable contributions. This has been the subject of numerous empirical studies using tax return data with a common empirical framework. I conclude that the tax responsiveness of charitable giving that has been detected using tax return data cannot be ascribed to the tax responsiveness of overstating actual giving. In fact, overstatement is apparently less responsive to price than actual giving is, which implies that the responsiveness of actual giving is higher than is suggested by studying reported contributions.

## **Why Don't the Elderly Live with Their Children?**

**Laurence J. Kotlikoff and John Morris**

Working Paper No. 2734

October 1988

JEL No. 918

Perhaps no single statistic raises more concern about post-World War II changes in the American family than the proportion of the elderly living alone. Since 1940 the proportion of elderly living alone and in institutions has risen dramatically. While demographics appear to explain much of the change in the living arrangements of the elderly, their rising income is viewed by many as the chief, or at least a chief, reason why the elderly live alone. However, the analyses underlying this view have not considered the incomes and preferences of the children of the elderly. This paper presents a model of the joint living arrangement choice of parents and children. It then uses a new set of data to consider how the preferences and income positions of the elderly and their children influence the living arrangements of elderly parents. The findings suggest that the preferences and income levels of children may be important in explaining why so many of the elderly live alone.

## **Making Bequests without Spoiling Children: Bequests as an Implicit Optimal Tax Structure and the Possibility that Altruistic Bequests Are Not Equalizing**

**Laurence J. Kotlikoff and Assaf Razin**

Working Paper No. 2735

October 1988

JEL No. 022

This paper examines the bequest/gift behavior of altruistic parents who do not know their children's abilities and cannot observe their children's work effort. Parents are likely to respond to this information problem by making larger bequests to higher-earning children and by using their transfers implicitly either to tax low-earning children at the margin or to subsidize high-earning children at the margin. These implicit tax rates may be quite large, despite the fact that total transfers are small. The paper suggests that labor supply studies should take into account potential implicit family taxation as well as official government taxation. In addition, the fact that the family may play an implicit role in taxation means that there may be less need for the government to play such a role.

## **Multicountry Modeling of Financial Markets**

**Jon Cockerline, John F. Helliwell, and Robert Lafrance**

Working Paper No. 2736

October 1988

JEL Nos. 431, 212, 311

After surveying alternative theoretical approaches to modeling financial markets, we examine and assess the domestic and international financial linkages of major multicountry models. We compare the properties of these models by calculating the slopes of their LM and BP curves for the United States, Germany, and Japan. The BP curves (horizontal by assumption in several models) almost always are found to be flatter than the estimated LM curves. International differences in LM slopes are not generally greater than inter-model differences in the estimated slopes of LM curves for any given country. Models with rational or model-consistent expectations in their financial markets tend to show more appreciation of the U.S. dollar in response to fiscal expansion than do models with adaptive expectations, although in both types of model the induced nominal exchange rate changes play a modest role in the transmission linking domestic spending to the current account. We make suggestions for modeling the increasing globalization of financial markets and for a more explicit treatment of learning behavior in the modeling of expectations.

## **The Dynamic Effects of Aggregate Demand and Supply Disturbances**

**Olivier Jean Blanchard and Danny Quah**

Working Paper No. 2737

October 1988

JEL Nos. 130, 210

We interpret fluctuations in GNP and unemployment as caused by two types of disturbances: those that have a permanent effect on output and those that do not. We call the first type supply disturbances and the second type demand disturbances.

We find that demand disturbances have a hump-shaped effect on both output and unemployment; the effect peaks after a year and vanishes after two to five years. Up to a scale factor, the dynamic effect of demand disturbances on unemployment is a mirror image of their effect on output. The effect of supply disturbances on output increases steadily, to reach a peak after two years and a plateau after five years. "Favorable" supply disturbances initially may increase unemployment. This is followed by a decline in unemployment, with a slow return over time to its original value.

While this dynamic characterization is fairly sharp, the data are not as specific on the relative contribu-

tions of demand and supply disturbances to output fluctuations. We find that the time series of demand-determined output fluctuations has peaks and troughs that coincide with most of the NBER peaks and troughs. But variance decompositions of output at different horizons, giving the respective contributions of supply and demand disturbances, cannot be estimated precisely. For instance, at a forecast horizon of four quarters we find that, under alternative assumptions, the contribution of demand disturbances ranges from 40 to over 95 percent.

## **Latin America's Intraregional Trade: Evolution and Future Prospects**

**Sebastian Edwards and Miguel Savastano**

Working Paper No. 2738

October 1988

JEL Nos. 400, 120

This paper analyzes in detail the evolution of Latin America's international trade patterns, focusing on intraregional trade and on the formal attempts to create free trade zones or custom unions. In particular, we assess the role of intraregional trade in the structural adjustment required by the Latin American debt crisis. The data show that the success of the commercial integration process has been quite limited. They also show that there has been no significant change in the OECD countries' share in Latin American imports or in the volume of intraregional trade flows since the early 1970s. Furthermore, the nature of the adjustment to the debt crisis of the 1980s indicates that Latin American markets possess a rather limited capacity to absorb a substantial increase in regional exports in the current context. Thus, we conclude that the success of the required expansion in Latin American exports will depend more on the region's ability to design innovative mechanisms to penetrate the markets of industrialized countries than on the deepening of any regional trade integration process.

## **Can Interindustry Wage Differentials Justify Strategic Trade Policies?**

**Lawrence F. Katz and Lawrence H. Summers**

Working Paper No. 2739

October 1988

This paper examines the relationship between labor market imperfections and trade policies. The available evidence suggests that pervasive industry wage differentials of up to 20 percent remain even after controlling



for differences in observed measures of workers' skill and the effects of unions. Theoretical analysis indicates that given noncompetitive wage differentials of this magnitude, policies directed at encouraging employment in high-wage sectors could significantly enhance allocative efficiency. For the United States and other developed countries, such policies are more likely to involve export promotion than import substitution. Increased international trade flows (at least through 1984) have been associated with increased employment in high-wage U.S. manufacturing industries relative to low-wage U.S. manufacturing industries.

## **Management of a Common Currency**

**Alessandra Casella and Jonathan Feinstein**

Working Paper No. 2740

October 1988

JEL No. 430

This paper presents a simple general equilibrium model of two countries that use a common currency. We ask how the monetary arrangement influences the optimal financing of a public good.

If the two countries are allowed to print the common currency autonomously, then they will finance their fiscal spending with money, oversupplying the public good and crowding out the private sector. The possibility of exporting part of the inflation creates a distortion in incentives such that the resulting equilibrium is strictly inferior in terms of welfare to the one prevailing under flexible exchange rates.

If the management of the common currency is deferred to an international central bank, then each country will try to use domestic policy variables (taxes) to manipulate the actions of the bank in its favor. With no independent domestic taxes, the bank can improve welfare. However, its policies naturally support the larger country; to induce the smaller country to participate requires giving it a disproportionately large, politically unrealistic, representation in the bank's objective function.

## **The Impact of the Potential Duration of Unemployment Benefits on the Duration of Unemployment**

**Lawrence F. Katz and Bruce D. Meyer**

Working Paper No. 2741

October 1988

This paper uses two datasets to examine the impact of the potential duration of unemployment insurance (UI) benefits on the duration of unemployment and on the time pattern of escaping from unemployment in

the United States. The first part of the empirical work uses a large sample of household heads to examine differences in the distributions of unemployment spells of UI recipients versus nonrecipients. Sharp increases in the rate of escape from unemployment, both through recalls and through new job acceptances, are apparent for UI recipients around the time when benefits are likely to lapse. The absence of such spikes in the escape rate from unemployment for nonrecipients strongly suggests that the potential duration of UI benefits affects firm recall policies and workers' willingness to start new jobs.

The second part of our empirical work uses administrative data to examine the effects of the level and length of UI benefits on the escape rate from unemployment among UI recipients. The results indicate that a one-week increase in the duration of potential benefits increases the average duration of unemployment spells by 0.16 to 0.20 weeks. The estimates also imply that policies that extend the potential duration of benefits increase the mean duration of unemployment by substantially more than policies with the same predicted impact on the total UI budget that raise the level of benefits while holding potential duration constant.

## **Does the Harberger Model Greatly Understate the Excess Burden of the Corporate Tax? Another Model Says Yes**

**Jane G. Gravelle and Laurence J. Kotlikoff**

Working Paper No. 2742

October 1988

JEL No. 321

An important deficiency in Harberger's (1962) model of corporate income taxation is its inability to consider both corporate and noncorporate production of the same good. This precludes analysis of within-industry substitution of noncorporate for corporate production in response to the tax. Such within-industry substitution potentially has major implications for both the excess burden and the incidence of the corporate tax.

In Gravelle and Kotlikoff (1988), we present a new model of the corporate income tax. The model has two key characteristics. First, corporate and noncorporate firms (with identical production functions) produce each of the model's goods both before and after corporate taxation is imposed; second, the decision of entrepreneurs to establish unincorporated business is endogenous. Compared with the Harberger model, the new model predicts a much larger excess burden from corporate income taxation. The incidence of the corporate tax also can differ dramatically in the two models.

Several commentators on our approach suggested that while corporate and noncorporate firms produce

goods that are close substitutes, they do not necessarily produce identical goods. Others questioned the extent to which our results hinged on the endogeneity of entrepreneurship. This paper is a response to those comments. It presents a Harberger-type model (with no entrepreneurs), in which each industry/sector contains corporate and noncorporate firms (with identical production functions) that produce goods that are close substitutes in demand. As in our earlier model, the scope for considerable within-industry substitution of noncorporate for corporate capital leads to a much larger excess burden than that in the Harberger model. For example, using Harberger's original 1957 data and assuming unitary substitution elasticities in production and in intersector demand, but substitution elasticities of 30 in intrasector demand, the excess burden of the corporate income tax in the current model is 107 percent of tax revenue. This figure is quite close to the 123 percent figure reported in Gravelle and Kotlikoff (1988) for the case of unitary substitution elasticities in production and interindustry demand. Both numbers are considerably larger than the 8 percent excess burden that arises in the traditional Harberger model with unitary substitution elasticities.

## **Human Resource Policies and Union-Nonunion Productivity Differences**

**Steven G. Allen**

Working Paper No. 2744

October 1988

Many researchers both in economics departments and in business schools recently have become interested in examining the effect of human resource decisions and policies on firm performance. This paper surveys the literature on unionism and productivity and discusses its implications for future research on these more general issues. It focuses on whether unions raise or lower productivity and on what procedures can be used to identify the channels through which unions affect productivity.

Previous studies have documented large productivity differences between seemingly comparable union and nonunion establishments. In many cases unionism is associated with higher productivity, especially when unionized firms are in a competitive environment. However, the mechanisms responsible for union-nonunion productivity differences in each study remain poorly understood, either because detailed information on how unions affected company decisions was not available or because the available information produced inconclusive results. This suggests that human resource policies can have a very large effect on financial outcomes, but that our ability to estimate the magnitude of that effect for any particular policy currently is very limited.

## **The Political Economy of War Debts and Inflation**

**Herschel I. Grossman**

Working Paper No. 2743

October 1988

JEL Nos. 134, 311, 321

This paper argues that before World War II the desire to maintain a reputation for trustworthiness in the honoring of war debts was an important factor in inducing deflationary postwar monetary policies in both the United Kingdom and the United States. The paper then asks why this policy objective did not serve to induce either a deflationary monetary policy or the honoring of war debts in full following World War II. The discussion focuses on differences in economic and political conditions after World War II, especially the extension of the voting franchise, the increased economic and political power of organized labor, and, perhaps most importantly, the large postwar demands on national resources with which the servicing of World War II debts had to compete. The analysis also argues that because these postwar developments were unforeseeable but verifiable contingencies, the partial default on World War II debts was excusable and, accordingly, did not cause either the United Kingdom or the United States to lose its reputation for trustworthiness.

## **Government Subsidies to Private Military R and D Investment: DOD's IR and D Policy**

**Frank W. Lichtenberg**

Working Paper No. 2745

October 1988

JEL Nos. 621, 114, 323

A relatively obscure defense procurement policy establishes a large subsidy to *private* military R and D investment. On the surface, it appears that the marginal subsidy to such investment is zero, but this is true only in the short run. Because of the Defense Department's policy of allowable-cost determination, the long-run subsidy is substantial. In fact, it is much larger than the subsidy provided by the R and D Tax Credit enacted in 1981. I calculate the subsidy by estimating an econometric model using contractor-level data from the Defense Contract Audit Agency. This subsidy may have an important influence on the amount and character of privately financed innovation in the United States.

## **Unobservables, Pregnancy Resolutions, and Birthweight Production Functions in New York City**

**Michael Grossman and Theodore J. Joyce**

Working Paper No. 2746

October 1988

JEL No. 913

This paper contributes to the estimation of health production functions and the economics of fertility control. We present the first infant health production functions that simultaneously control for self-selection in the resolution of pregnancies as live births or induced abortions and in the use of prenatal medical care services. We also incorporate the decision of a pregnant woman to give birth or to obtain an abortion into economic models of fertility control and use information conveyed by this decision to refine estimates of infant health production functions and demand functions for prenatal medical care.

## **Marriage Bars: Discrimination against Married Women Workers, 1920s to 1950s**

**Claudia Goldin**

Working Paper No. 2747

October 1988

Modern personnel practices, social consensus, and the Depression acted in concert to delay the emergence of married women in the American economy through an institution known as the "marriage bar." Marriage bars were policies adopted by firms and local school boards, from about the early 1900s to 1950, to fire single women when they married and not to hire married women. I explore their determinants using firm-level data from 1931 and 1940 and find that they are associated with promotion from within, tenure-based salaries, and other modern personnel practices. The marriage bar, which at its height had affected 75 percent of all local school boards and more than 50 percent of all office workers, was virtually abandoned in the 1950s when the cost of limiting labor supply increased greatly.

## **The Behavior of Homebuyers in Boom and Post-Boom Markets**

**Karl E. Case and Robert J. Shiller**

Working Paper No. 2748

October 1988

JEL No. 932

A questionnaire looked at homebuyers in May 1988

in two "boom" cities (Anaheim and San Francisco) currently experiencing rapid price increases, a "post-boom" city (Boston) whose home prices are stable or falling after two years of rapid price increases, and a "control" city (Milwaukee) where home prices have been very stable.

Homebuyers in the boom cities had much higher expectations for future price increases and were more influenced by investment motives. The interpretations that people place on the boom usually are not related to any concrete news event; instead there are oft-repeated cliches about home prices. This suggests that sudden real estate booms have, at least in part, a social rather than a rational or economic basis.

There is evidence for excess demand in boom markets and excess supply in the post-boom market; there appear to be various reasons for this, including notions of fairness, intrinsic worth, popular theories about prices, coordination problems, and simple mistakes.

## **Costs and Benefits of Prenatal Screening for Cystic Fibrosis**

**Joseph P. Fenerty and Alan M. Garber**

Working Paper No. 2749

October 1988

JEL No. 913

Newly developed genetic tests based on restriction fragment length polymorphisms (RFLPs) promise to facilitate the early detection of genetic diseases. Several such tests are now available for the prenatal detection of cystic fibrosis (CF), a common and costly disease. The tests for CF currently are limited to prenatal diagnosis in siblings of a victim of CF. Direct gene probe tests, which have yet to be developed for CF, would be applicable even in families that have not already borne a child with the disease. We examine the costs and benefits of prenatal testing for cystic fibrosis using existing RFLP-based tests and a hypothetical direct gene probe test. We find that even an expensive RFLP-based testing program produces substantial net benefits, because it is applied in pregnancies in which the risk of CF is 25 percent. If a direct gene probe test is applied in all pregnancies, it will need to be much less expensive to generate net benefits, and it will lead to the abortion of many normal fetuses unless it is highly specific. Because these new tests are likely to generate substantial savings in medical expenditures and to increase lifetime earnings, parents of CF-affected children may be subjected to strong pressures to participate in prenatal testing programs and to abort fetuses that test positive.

## **Commodity Prices as a Leading Indicator of Inflation**

**James M. Boughton and William H. Branson**

Working Paper No. 2750

October 1988

JEL No. 134

This paper studies the value of broad commodity price indexes as predictors of consumer price inflation in the G-7 industrial countries. After an introduction, the paper discusses the theoretical relationship between commodity and consumer prices and the conditions under which, in general, one would expect commodity prices to be a leading indicator of inflation. It then presents tests of the relationships between conventional broad indexes of commodity prices and consumer prices, and uses the data on individual commodities to generate the optimum weights in a commodity price index for forecasting G-7 inflation. We find that commodity and consumer prices are not co-integrated; the hypothesis that there is a reliable long-run relationship between the level of commodity prices and the level of consumer prices may be rejected. There is a tendency for changes in commodity prices to lead those in consumer prices, at least when the data are denominated in a broad index of the currencies of major countries. However, although the inclusion of commodity prices significantly improves the in-sample fit of regressions of an aggregate (multi-country) consumer price index, the results may not be sufficiently stable to improve post-sample forecasts. Estimated alternative commodity price indexes, in which the weights are chosen so as to minimize the residual variance in aggregate inflation regressions, track the behavior of the aggregate CPI reasonably well in-sample. However, the estimated indexes work only moderately well in post-sample predictions, and they do not appear to offer significant advantages over the conventional export-weighted index. Perhaps the most important result is that turning points in commodity price inflation frequently precede turning points in consumer price inflation for the large industrial countries as a group.

## **Coalitions in the Uruguay Round: The Extent, Pros, and Cons of Developing Country Participation 1, 2**

**Colleen Hamilton and John Whalley**

Working Paper No. 2751

October 1988

This paper documents the involvement of developing countries in coalitional activity in the current General Agreement on Tariffs and Trade Uruguay Round thus far and provides a rudimentary evaluation of the

pros and cons of the various options for the developing countries as far as coalitional strategies are concerned. We conclude that much of the coalitional activity thus far has been agenda-moving and joint proposal-making, rather than negotiation involving exchanges of concession. At the same time, coalitional activity by a larger group of mid-sized developed and smaller developing countries who see a major interest in preserving the multilateral system has been central to the negotiation process.

## **Pension Fund Investment Policy**

**Zvi Bodie**

Working Paper No. 2752

October 1988

JEL No. 520

This paper surveys the investment policy of pension funds. Pension fund investment policy depends critically on the type of plan: defined-contribution versus defined-benefit. For defined-contribution plans investment policy is not much different than it is for an individual deciding how to invest the money in an Individual Retirement Account. The guiding principle is efficient diversification: that is, achieving the maximum expected return for any given level of risk exposure. The special feature is the fact that investment earnings are not taxed as long as the money is held in the pension fund. This consideration should cause the investor to tilt the asset mix of the pension fund toward the least tax-advantaged securities, such as corporate bonds.

For defined-benefit plans, the practitioner literature seems to advocate immunization strategies to hedge benefits owed to retired employees and portfolio insurance strategies to hedge benefits accruing to active employees. Academic research into the theory of optimal funding and asset allocation rules for corporate defined-benefit plans concludes that if their objective is maximization of shareholder wealth, these plans should pursue extreme policies. For healthy plans, the optimum is full funding and investment exclusively in taxable fixed-income securities. For very underfunded plans, the optimum is minimum funding and investment in the riskiest assets. Empirical research so far has failed to decisively confirm or reject the predictions of this theory of corporate pension policy.

Recent rule changes adopted by the Financial Accounting Standards Board regarding corporate reporting of defined-benefit plan assets and liabilities may lead to a significant shift into fixed-income securities. The recent introduction of price-level-indexed securities in U.S. financial markets may lead to significant changes in pension fund asset allocation. By giving plan sponsors a simple way to hedge inflation risk, these securities make it possible to offer plan participants inflation protection both before and after retirement.

## **Altruism, Rivalry, and Crowding-Out in the Nonprofit Firm's Supply of Charity Services: The Case of Hospitals**

**Richard G. Frank and David S. Salkever**  
Working Paper No. 2753  
October 1988  
JEL No. 913

This paper extends to the behavior of nonprofit firms previous research on individuals' supply of charitable donations. Specifically, we study the provision of charity care by private, nonprofit hospitals. We demonstrate that in the absence of large positive income effects on the supply of charity care, convex preferences for the nonprofit hospital imply crowding out by other private or government hospitals. Extending our model to include patient homogeneity and impure altruism (rivalry) provides a possible explanation for the previously reported empirical result that *both* crowding out and income effects on the supply of indigent care are often weak or insignificant. Empirical analysis of data for hospitals in Maryland provides strong evidence of rivalry on the supply of outpatient plus inpatient charity, but not when the analysis is confined to inpatient care.

## **Testing Strategic Bargaining Models Using Stock Market Data**

**Joseph S. Tracy**  
Working Paper No. 2754  
November 1988  
JEL No. 832

This paper presents three empirical tests of a class of asymmetric information bargaining models using stock market data. The basic idea behind these models is that protracted bargaining can be used to infer information that is privately known to another party to the negotiations. A fundamental implication of these models is that there should be evidence that negotiations result in learning. In the context of union contract negotiations, if bargaining is motivated primarily by the union's uncertainty over the firm's future profitability, then there should be evidence that contract negotiations reduce this uncertainty. I test this prediction by comparing the variance of the firm's stock price prior to and following a contract negotiation. The data indicate that bargaining results in a significant reduction in this variance. Other predictions of these bargaining models are that the firm's stock price should decline during a strike and increase on the settlement date. The data generally support these predictions with the exception of a decline in the firm's equity value following the settlement of a contract that did not involve a strike.

## **Comparisons of Public and Private Sector Union Wage Differentials: Does the Legal Environment Matter?**

**Joseph S. Tracy**  
Working Paper No. 2755  
November 1988  
JEL No. 832

A stylized fact in the growing literature on public sector labor markets is that estimates of public sector union wage premiums are significantly lower than estimates of private sector union wage premiums. In this paper, I investigate the hypothesis that this difference may be caused in part by the differing legal environments in which public and private sector unions operate. Using data from the Current Population Survey and the Census of Population, I find that public sector union wage differentials increase significantly with the degree of legal protection afforded to the union in bargaining. However, when no legal controls are included in the specification, the estimated public sector union wage premiums are close to the estimated premiums under the strongest legal environment. Consequently, while controlling for the legal environment in the public sector is important, it may not reconcile the differences between estimated public and private sector union wage premiums.

## **A Theory of Managed Trade**

**Kyle Bagwell and Robert W. Staiger**  
Working Paper No. 2756  
November 1988  
JEL Nos. 411, 421, 422

This paper proposes a theory that predicts low levels of protection during periods of "normal" trade volume coupled with episodes of "special" protection when trade volumes surge. This dynamic pattern of protection emerges from a model in which countries choose levels of protection in a repeated game setting facing volatile trade swings. High trade volume leads to a greater incentive to unilaterally defect from cooperative tariff levels. Therefore, as the volume of trade expands, the level of protection must rise in a cooperative equilibrium to mitigate the rising trade volume and to hold in check the incentive to defect.

## **Theoretical Developments in the Light of Macroeconomic Policy and Empirical Research**

**Michael Bruno**  
Working Paper No. 2757  
November 1988

This paper surveys the macroeconomic literature of the last decade, emphasizing the implications of the New Classical and Rational Expectations critiques for the Keynesian paradigm and the role of macro policies. The background is the main macro developments of the 1970s and 1980s and the specific lessons of recent high (chronic) inflation processes.

The paper takes an eclectic view, emphasizing an emerging synthesis that maintains the basic Keynesian view of the existence of market and price coordination failures and leaves room for Pareto-improving policy intervention. At the same time, the theoretical underpinnings are undergoing substantial change mainly because of a rational expectations (rather than new classical) reformulation. I also discuss and illustrate the new Theory of Economic Policy in terms of recent stabilization experience.

## **Financial Factors in Business Fluctuations**

**Mark Gertler and R. Glenn Hubbard**  
Working Paper No. 2758  
November 1988  
JEL No. 310

Recent research in macroeconomics—both theoretical and empirical—has resurrected the idea that capital market imperfections may be significant factors in business volatility. This paper outlines a case for a financial aspect to business fluctuations, in light of the contributions of this new literature. We present a theoretical model that explicitly motivates how financial factors may affect investment. We then report some existing tests of the model's basic predictions and also present two new sets of results. The first demonstrates that the inverse relationship between sales variability and size, documented in many studies, may be caused by financial rather than technological factors, in contrast to the conventional view. The second supports a theoretical prediction of the model, that the effects of capital market frictions on investment should be asymmetric—having more impact in recessions than in booms. The final section of the paper presents conclusions and addresses some policy questions.

## **Voting on the Budget Deficit**

**Alberto Alesina and Guido Tabellini**  
Working Paper No. 2759  
November 1988  
JEL Nos. 320, 025

This paper analyzes a model in which different rational individuals vote on the composition and timing of public spending. Potential disagreement between current and future majorities generates instability in the social choice function that aggregates individual preferences. In equilibrium, a majority of the voters may favor a budget deficit. The size of the deficit under majority rule tends to be larger as the polarization between current and potential future majorities increases. The paper also shows that the ex ante efficient equilibrium of this model involves a balanced budget. However, a balanced budget amendment is not durable under majority rule.

## **The Effect of Multinational Firms' Foreign Operations on Their Domestic Employment**

**Irving B. Kravis and Robert E. Lipsey**  
Working Paper No. 2760  
November 1988

Given the level of its production in the United States, a firm that produces more abroad tends to have fewer employees in the United States and tends to pay slightly higher salaries and wages to them. The most likely explanation seems to be that the larger a firm's foreign production, the greater its ability to allocate the more labor-intensive and less skill-intensive portions of its activity outside the United States. This relationship is stronger among manufacturing firms than among service industry firms, probably because services are less tradable than manufactured goods or components, and service industries therefore may be less able to break up the production process to take advantage of differences in factor prices.

## **Differences in Income Elasticities and Trends in Real Exchange Rates**

**Paul R. Krugman**  
Working Paper No. 2761  
November 1988  
JEL No. 431

One might expect that differences in income elasticities

ties in trade, and/or differences in growth rates among countries, would give rise to strong secular trends in real exchange rates: for example, fast-growing countries might need steady depreciation to get the world to accept their growing exports. In fact, income elasticities are related systematically to growth rates by the "45-degree rule," under which fast-growing countries appear to face high income elasticities of demand for their exports, while having low income elasticities of import demand. The net effect of this relationship between elasticities and growth rates is that secular trends in real exchange rates are much smaller than one might have expected otherwise: relative purchasing power parity holds fairly well. This paper documents the existence of a "45-degree rule" and suggests an explanation in terms of increasing returns and product differentiation.

### **Mean Reversion in Equilibrium Asset Prices**

**Stephen G. Cecchetti, Pok-sang Lam,  
and Nelson C. Mark**

Working Paper No. 2762  
November 1988  
JEL No. 313

Recent empirical studies have found that stock returns contain substantial negative serial correlation at long horizons. We examine this finding with a series of Monte Carlo simulations in order to demonstrate that it is consistent with an equilibrium model of asset pricing. When investors display only a moderate degree of risk aversion, commonly used measures of mean reversion in stock prices calculated from actual returns data nearly always lie within a 60 percent confidence interval of the median of the Monte Carlo distributions. From this evidence we conclude that the degree of serial correlation in the data could have been generated plausibly by our model.

### **Financial Capacity, Reliquification, and Production in an Economy with Long-Term Financial Arrangements**

**Mark Gertler**

Working Paper No. 2763  
November 1988  
JEL Nos. 023, 131

This paper characterizes a multiperiod production economy in which borrowers and lenders enter long-

term financial contracts. Aggregate production and borrowers' capacity to absorb debt—their "financial capacity"—are jointly determined endogenous variables, in the spirit of Gurley and Shaw (1955). Expectations of future economic conditions govern financial capacity, which in turn influences current capacity utilization. Further, disturbances now may persist into the future by influencing borrowers' net asset positions. Finally, borrowers may substitute future for current production by preserving their assets in hard times, behavior akin to reliquification as described in Eckstein and Sinai (1986).

### **Bank Runs in Open Economies and the International Transmission of Panics**

**Peter M. Garber and Vittorio U. Grilli**

Working Paper No. 2764  
November 1988  
JEL No. 430

In this paper, we extend the literature on bank runs to an open economy. We show that a foreign banking system, by raising deposit rates in the presence of a domestic banking panic, may generate sufficient liquid resources to acquire assets sold by the domestic banking system at bargain prices. In this case, foreign depositors will benefit from the domestic panic. We also show that our simple model is able to generate the spreading of panics. Perhaps not surprisingly, the crucial element in determining the propagation of financial crises is the effect of interest rates on savings decisions.

### **Production, Sales, and the Change in Inventories: An Identity That Doesn't Add Up**

**Jeffrey A. Miron and Stephen P. Zeldes**

Working Paper No. 2765  
November 1988  
JEL Nos. 130, 220

We examine two measures of monthly manufacturing production: the index of industrial production; and a second measure constructed from the accounting identity that output equals sales plus the change in inventories. We show that the means, variances, and serial correlation coefficients of the log growth rates differ substantially between the two series. The cross-correlations between the two seasonally adjusted series in most cases are less than 0.4. A model of classical measurement error indicates that in 15 out of 20 two-digit industries, measurement error accounts for over 35 percent of the variation in the monthly growth rates of seasonally adjusted industrial production.



## **How Do Fixed Exchange Rate Regimes Work? The Evidence from the Gold Standard, Bretton Woods, and the EMS**

**Alberto Giovannini**  
Working Paper No. 2766  
November 1988  
JEL Nos. 431, 432

This paper defines two competing hypotheses about the working of fixed exchange rates. The "symmetry" hypothesis states that every country is concerned with the smooth functioning of the system and cannot afford to deviate from world averages. Every country simply is left to follow the "rules of the game"; that is, to avoid sterilizing balance of payments flows. The world price level is pegged down either by an external numeraire like gold, or by cooperation among central banks, in a fiat currency system.

The competing hypothesis states that fixed exchange rate regimes are inherently asymmetric: they are characterized by a "center country" that provides the nominal anchor for the others, either by managing the gold parity in a centralized fashion, or by arbitrarily setting some other nominal anchor. I discuss the empirical evidence used to discriminate between the two hypotheses that comes from studying the institutional features and the data on three experiences of fixed rates: the International Gold Standard, the Bretton Woods regime, and the European Monetary System.

## **Sovereign Debt Buybacks Can Lower Bargaining Costs**

**Julio J. Rotemberg**  
Working Paper No. 2767  
November 1988

I develop two models in which debt repurchases by highly indebted sovereign nations are advantageous for all parties. The models are based on the idea that when sovereign debts are large, bargaining costs are large. Creditors spend more resources convincing the debtor that they are tough when they have more at stake. Also, the sanctions that sometimes are triggered when bargaining fails to produce an agreement are larger when debts are larger. For both these reasons, buybacks, which reduce the face value of the outstanding debt, can be beneficial. The resulting equilibriums are constrained to be Pareto optimal. But, donors who subsidize buybacks increase overall welfare more than donors who make direct gifts. I also argue that Bulow and Rogoff's (1988) empirical evidence on buybacks is consistent with my models.

## **Unexpected Inflation, Real Wages, and Employment Determination in Union Contracts**

**David Card**  
Working Paper No. 2768  
November 1988  
JEL No. 824

This paper presents new microeconomic evidence on the relevance of nominal contracting for employment determination in the unionized sector. Real wages in long-term union contracts contain an unanticipated component that reflects unexpected changes in prices and the degree of indexation. These unexpected wage components provide a convenient tool for separating the causal effects of wages on employment from other endogenous sources of employment and wage variation.

The empirical analysis of employment and wage outcomes among collective agreements in the Canadian manufacturing sector reveals that employment and wages are related only weakly. When unexpected changes in real wages are used as an instrumental variable for the contract wage, however, employment is consistently negatively related to wages. The results imply that the institutional structure of wage determination has important effects on the cyclical characteristics and persistence of employment changes.

## **Intellectual Property Rights and North-South Trade**

**Judith C. Chin and Gene M. Grossman**  
Working Paper No. 2769  
November 1988  
JEL Nos. 421, 621

We study the incentive that a government in the South has to protect the intellectual property rights of northern firms, and the consequences of the decision made in the South for welfare in the North and for efficiency of the world equilibrium. We conduct our analysis in the context of a competition between a single northern producer and a single southern producer selling some good to an integrated world market. In this competition, only the northern firm has the ability to conduct R and D in order to lower its production costs, but the southern firm can imitate costlessly if patent protection for process innovations is not enforced by the government of the South. We find that the interests of the North and the South generally conflict in the matter of protection of intellectual property, with the South benefiting from the ability to pirate technology and the North harmed by such actions. A strong system of intellectual property rights may or may not enhance world efficiency.

## Monetary Policy Strategies

**Robert P. Flood and Peter Isard**

Working Paper No. 2770

November 1988

JEL Nos. 310, 311

This paper considers the merits of rules and discretion for monetary policy when the structure of the macroeconomic model and the probability distributions of disturbances are not well defined. We argue that when it is costly to delay policy reactions to seldom-experienced shocks until formal algorithmic learning has been accomplished, and when time consistency problems are significant, then a mixed strategy that combines a simple verifiable rule with discretion is attractive. The paper also discusses mechanisms for mitigating credibility problems and emphasizes that arguments against various types of simple rules lose their force under a mixed strategy.

## Simple Analytics of Debt-Equity Swaps

**Elhanan Helpman**

Working Paper No. 2771

November 1988

Recent attempts to resolve the international debt crisis have led some countries to engage in debt-equity swaps. This paper explores conditions under which such transactions are beneficial to the debtor as well as to the creditors. It identifies a market failure that may prevent the emergence of mutually beneficial swaps on the investment level in the debtor country. The latter helps to evaluate the contribution of this policy to future difficulties with debt service payments.

## A Probability Model of the Coincident Economic Indicators

**James H. Stock and Mark W. Watson**

Working Paper No. 2772

November 1988

JEL Nos. 131, 132

The Index of Coincident Economic Indicators, currently compiled by the U.S. Department of Commerce, is designed to measure the state of overall economic activity. The index is constructed as a weighted average of four key macroeconomic time series, in which the weights are obtained by using rules that date to the early days of business cycle analysis. This paper presents an explicit time-series model (formally, a dynamic factor analysis or "single-index" model) that implicitly

defines a variable that can be thought of as the overall state of the economy. Upon estimating this model using data from 1959-87, we find the unobserved variable to be highly correlated with the official Commerce Department series, particularly over business cycle horizons. Thus the model provides a formal rationalization for the traditional methodology used to develop the Coincident Index. Initial exploratory exercises indicate that traditional leading variables can prove useful in forecasting the short-run growth in this series.

## Current Account and Budget Deficits in an Intertemporal Model of Consumption and Taxation Smoothing. A Solution to the "Feldstein-Horioka Puzzle"?

**Nouriel Roubini**

Working Paper No. 2773

November 1988

JEL No. 431

This paper presents an infinite-horizon model of consumption and taxation "smoothing" that implies a simple relationship among current accounts, budget deficits, investment rates, and transitory output shocks. I argue that such a model could explain the "Feldstein-Horioka puzzle" of the apparent lack of international capital mobility. Traditional regressions of the savings rate on the investment rate, as performed in the literature, are incorrect tests of the hypothesis of capital mobility because they do not control for the independent role of budget deficits and temporary output shocks in the current account and savings equations. Empirical tests of the model for a sample of 18 OECD countries present good evidence that international capital markets are widely integrated and that the "Feldstein-Horioka puzzle" might be explained by the important role of fiscal deficits in the determination of the current account and the saving behavior.

## Portfolio Choice and Asset Pricing with Nontraded Assets

**Lars E. O. Svensson**

Working Paper No. 2774

November 1988

JEL Nos. 430, 313

This paper examines portfolio choice and asset pricing when some assets are nontraded: for instance, when a country cannot trade claims to its output on world capital markets; when a government cannot trade claims to future tax revenues; or when an individual cannot

trade claims to his future wages. I emphasize the close relationship between portfolio choice with, and implicit pricing of, nontraded assets. I derive a variant of Cox, Ingersoll, and Rose's Fundamental Valuation Equation and use it to interpret the optimal portfolio. I then present explicit solutions to the portfolio and pricing problem for some special cases, including when income from the nontraded assets is a diffusion process, not spanned by traded assets, and affected by a state variable.

## **Real Exchange Rates and Macroeconomics: A Selective Survey**

**Rudiger Dornbusch**

Working Paper No. 2775

November 1988

JEL No. 430

This paper discusses exchange rate issues in advanced and in developing countries. For the determination of exchange rates among industrialized countries, the key question is: What is the right framework—the monetary approach, the equilibrium approach, the new classical approach, or the macroeconomic model in the tradition of Mundell–Fleming? To shed light on that question, I consider two empirical problems: What is known about the behavior of real exchange rates, and how well do alternative models explain the relationship among interest rates, expected depreciation, and actual depreciation?

The second half of the paper discusses real exchange rates in developing countries. This strand of literature has become important in the context of adjustment programs. I focus on the relationship between real exchange rates and the profitability of capital. The model highlights the sharp discrepancy between the mobility of capital (even physical capital, in the long run) and the immobility of labor.

## **Production-Based Asset Pricing**

**John M. Cochrane**

Working Paper No. 2776

November 1988

This paper exploits producers' first-order conditions to link asset prices to data on investment, output, and the like, through marginal rates of transformation, just as consumers' first-order conditions commonly are used to link asset prices to consumption data, or to proxies, through marginal rates of substitution. It presents simulation economies, analogous to the consumption-based models of Mehra and Prescott (1985) and Backus, Gregory, and Zin (1986), that capture the size of the equity premium and the size and cyclical timing of the forward rate term premium.

## **Offset and Sterilization under Fixed Exchange Rates with an Optimizing Central Bank**

**Nouriel Roubini**

Working Paper No. 2777

November 1988

JEL No. 431

The traditional approach to the estimation of the offset and sterilization equations can be criticized for the ad hoc specification of the reaction function of the monetary authorities and for the endogeneity of the domestic credit and foreign reserve variables. This paper proposes an alternative analytical model in which the sterilization and offset equations are derived from an explicit maximization problem solved by the monetary authority. In such a model, the optimal intervention and sterilization policies of the monetary authority are shown to be dependent on the different disturbances hitting the economy and the preferences of the monetary authority. In particular, under a wide range of domestic and foreign disturbances, the optimal response of the central bank will lead to negatively correlated comovements of domestic credit and foreign reserves if the central bank cares more about the interest rate smoothing objective than about the goal of foreign exchange reserve stabilization. Conversely, positive correlations between domestic credit and foreign reserves will occur if the foreign reserve objective is dominant.

## **Seigniorage in Europe**

**Vittorio U. Grilli**

Working Paper No. 2778

November 1988

JEL Nos. 311, 430

This paper uses the experience of ten European countries to study the relevance of seigniorage revenues in the recent past and to speculate about their importance in the near future. I find that the members of the European Community differ widely in the way they manage monetary policies. While I could not identify any consistent seigniorage policy for some of the European countries, seigniorage appears to have been an important component of the financing policies for others. This lack of consensus about the role of monetary policies is a potential source of conflict in designing common exchange rate policies.

A formal analysis of the current status of the finances of the governments of the ten European countries also reveals that several of them are now following budget policies that are potentially incompatible with their long-run solvency. This also represents a major obsta-

cle toward monetary unification on exchange rate stability. Member countries will be faced with quite different needs for revenues, and eliminating a (politically) flexible instrument such as seigniorage may result in an unstable situation.

### **A Bequest-Constrained Economy: Welfare Analysis**

**Mark Nerlove, Assaf Razin, and Efraim Sadka**  
Working Paper No. 2779  
December 1988

Bequest constraints have played a major role in discussions of debt neutrality but their welfare implications have not been dealt with sufficiently in the literature. This paper focuses on the welfare implications of bequest constraints. We find that when institutional constraints exist on the transfer of resources from children to their parents, the welfare of the parents' generation may be improved by an old age security scheme. Such a scheme is justified not by considerations of income redistribution, as is typically the case, but rather on pure efficiency grounds. Because of its role as an intergenerational transfer, the Social Security scheme is Pareto-improving with altruistic parents if the real income effect, which tends to raise children's consumption, is also relatively strong.

### **Asset Prices and Time-Varying Risk**

**Robert P. Flood**  
Working Paper No. 2780  
December 1988  
JEL No. 227

Observers often have characterized asset markets as being subject to periods of tranquility and periods of turbulence. However, until recently, researchers were unable to produce closed-form asset pricing formulas in an environment of time-varying risk. Some work by Abel provided us with the insights needed to produce such formulas. This paper explains how to develop the formulas using a simple extension of standard tools.

While the paper is intended mainly as an exposition of new work, it also contains a report on the asset market effect of fiscal reform. I find that entering a period of weak coordination between government spending and taxing (tax rate) policy is good for stock prices.

### **Tariffs, Capital Accumulation, and the Current Account in a Small Open Economy**

**Partha Sen and Stephen J. Turnovsky**  
Working Paper No. 2781  
December 1988  
JEL Nos. 422, 431

This paper analyzes the effects of a tariff in an intertemporal optimizing model, emphasizing the role of capital accumulation. We consider three types of increases in the tariff rate: unanticipated permanent; unanticipated temporary; and anticipated permanent. We draw two general conclusions from the analysis.

First, the introduction (or increase) of a tariff is contractionary, both in the short run and in the long run. In particular, employment is reduced both in the short run and in the long run, so that there is no significant intertemporal trade-off, as derived by previous authors. The fall in the long-run capital stock causes an immediate reduction in the rate of investment, which in turn leads to a current account surplus. While this response of the current account is in accordance with much (but not all) of the existing literature, the mechanism by which it is achieved, namely the decumulation of capital, has not been considered previously. Also, the fact that the declining capital stock is accompanied by an accumulation of foreign bonds means that the savings effect of the tariff is unclear, depending upon which influence dominates. However, this ambiguity of savings is very different from what occurs in other studies.

Second, the steady state depends upon the initial stocks of the assets. By altering these initial conditions for some later date when the tariff is removed, a temporary tariff leads to a permanent effect on the economy.

### **The Determinants of Employee Productivity and Earnings: Some New Evidence**

**Harry J. Holzer**  
Working Paper No. 2782  
December 1988  
JEL No. 820

This paper uses data from a nationwide sample of firms to reexamine the determinants of employee productivity and earnings. The data include several measures of job experience, training, and both worker and firm characteristics, as well as earnings of workers and subjective ratings of employee productivity. Given observations on the same individual at different times, we can consider both levels and changes in earnings and productivity, with various firm- and job-specific effects eliminated from the latter.

The results show that: 1) Both previous experience and tenure in the current job have significant, positive effects on wages and productivity. Previous experience

primarily affects levels of wages and productivity while tenure affects both current levels and changes. 2) Hours of training are related positively to productivity and wage growth but generally unrelated to current levels of either. 3) Productivity growth and current levels of productivity are slightly higher for females, while their wages are significantly lower than men's wages. I also consider other determinants of earnings and productivity ratings (for example, various types of incentive pay and the fraction unionized).

## **Implications of the Illinois Reemployment Bonus Experiments for Theories of Unemployment and Policy Design**

**Bruce D. Meyer**

Working Paper No. 2783

December 1988

JEL No. 820

Reemployment bonus experiments offer large lump-sum payments to unemployment insurance recipients who find a job quickly. Such experiments are underway or recently have been completed in four states. This paper analyzes the results from Illinois and discusses the implications of the experiments for theories of unemployment and policy design.

I examine the hazard rate of exit from unemployment and find that it is significantly higher for the experimental groups, but only during the period of bonus eligibility. Both labor supply and search theories of unemployment suggest a rise in the reemployment hazard just before the end of bonus eligibility and larger effects of the fixed-amount bonus for lower-income groups. I find only weak support for these hypotheses, which suggests limitations of the model of unemployment.

The experiments demonstrate the effects of economic incentives on job finding behavior but they do not show the desirability of a permanent reemployment bonus program. Evidence from another sample suggests that as many as half of those who received a reemployment bonus returned to their previous employer. A bonus program that pays people who return to their last employer would encourage temporary layoffs. I find that a permanent program could increase the frequency or promptness of filing, thus reducing any financial advantages of a bonus program.

## **Forecasting Pre-World War I Inflation: The Fisher Effect Revisited**

**Robert B. Barsky and J. Bradford De Long**

Working Paper No. 2784

December 1988

JEL No. 311

We consider the puzzling behavior of interest rates and inflation in the United State and the United King-

dom between 1879 and 1913. A deflationary regime prior to 1896 was followed by an inflationary one from 1896 until the beginning of World War I; the average inflation rate was 3.8 percentage points higher in the second period than in the first. Yet nominal interest rates were no higher after 1896 than they had been before. This nonadjustment of nominal interest rates would be consistent with rational expectations if inflation were not forecastable. However, inflation was forecastable on the basis of lagged gold production. Investors' expectations of inflation should have risen by at least three percentage points in the United States between 1890 and 1910. In an information processing context, we consider alternative ways of accounting for this failure of interest rates to adjust: for example, the possible belief that increases in gold production might be transitory. We conclude that the failure of investors to exhibit foresight with regard to the shift in the trend inflation rate after 1896 is not persuasive evidence that investors were negligent or naive in processing information.

## **Credibility, Debt, and Unemployment: Ireland's Failed Stabilization**

**Rudiger Dornbusch**

Working Paper No. 2785

December 1988

JEL Nos. 134, 431

Can the credibility of a stabilization plan affect the output costs of disinflation? The new classical economics has asserted this possibility, but little evidence has been brought forward. This paper analyzes the stabilization program of Ireland in the 1980s against the background of the new classical economics. The main questions are: Did European Monetary System (EMS) membership yield a special credibility bonus? And, is the stabilization program sustainable? The answer to both questions is no.

The idea of a credibility bonus is an attractive potential policy implication of EMS membership: by joining the EMS, playing by rules of fixed exchange rates, and benefiting from the stabilizing influence of German inflation targets, a country's policymakers achieve a dramatic turnaround in expectations, inflation, and long-term interest rates. But the evidence on international disinflation in the 1980s shows that it was not limited to EMS members: all OECD countries experienced sharply reduced inflation and a large drop in long-term nominal interest rates. EMS membership did not contribute to reducing the sacrifice ratio of disinflation. In fact, Germany, on whose anti-inflation credentials the credibility effects supposedly are based, has one of the highest sacrifice ratios among the OECD countries.

Ireland did reduce inflation to the German level, but a serious public debt problem has emerged and the unemployment rate stands near 20 percent. This raises questions of the Sargent-Wallace type about the sustainability of the program.

## **Can the European Monetary System Be Copied Outside Europe? Lessons from Ten Years of Monetary Policy Coordination in Europe**

**Francesco Giavazzi and Alberto Giovannini**  
Working Paper No. 2786  
December 1988  
JEL No. 432

This paper addresses the question of whether the European Monetary System (EMS) can be copied outside of Europe. The EMS is just one element of a more comprehensive design of institutional integration within Europe: the presence of the European Economic Community (EEC), and the dependence of EEC institutions upon exchange rate stability, lend credibility to EMS exchange rate targets in a way that would not be present, say, among the United States, Europe, and Japan. The EMS also has reproduced previous experiences of fixed exchange rates by not imposing the exchange rate constraint symmetrically upon all member countries: the system has de facto worked as a deutsche mark zone, thus confirming that the institution of fixed rates per se cannot induce international monetary cooperation. Finally, the differences in the use of the inflation tax among European countries and the divergent behavior of government debt after 1979 indicate that the pursuit of monetary convergence among countries with different fiscal structures might entail substantial fiscal reforms.

## **The Dynamics of Living Arrangements of the Elderly**

**Axel Börsch-Supan, Laurence J. Kotlikoff, and John N. Morris**  
Working Paper No. 2787  
December 1988  
JEL No. 918

This paper uses a new dataset to study the choice of living arrangements of some 3000 Massachusetts elderly between 1982 and 1986. The data have a number of unique features: they are longitudinal and combine detailed information on health with information on economic status and family relations. This paper considers the influence on living arrangements of alternative measures of health (subjective versus functional abilities versus diagnosed condition), incomes and

marital status of parents, and the number and sexes of children. It also examines the extent to which changes in health and the death of a spouse trigger changes in living arrangements and how rapidly such changes occur.

We find that functional ability indexes are very good predictors of living arrangements, while subjective health reports are poor predictors of living arrangements. Further, the probability of institutionalization declines rapidly with the income of the elderly. Older daughters are much more likely than older sons to share living quarters with their parents. Moreover, living arrangements are fairly stable. When changes in living arrangements occur, they often are triggered by changes in health status or the death of a spouse. When deterioration in health status or the death of a spouse leads to a change in living arrangements, it typically occurs within a year of the triggering event.

## **Estimating the Age-Productivity Profile Using Lifetime Earnings**

**Laurence J. Kotlikoff**  
Working Paper No. 2788  
December 1988  
JEL No. 821

Understanding how productivity varies with age is important for a variety of reasons. A decline in productivity with age implies that aging societies must depend increasingly on the labor supply of the young and middle-aged. It also means that policies designed to keep the elderly in the work force, while potentially good for the elderly, may decrease overall productivity. A third implication is that, absent government intervention, employers may not be willing to hire the elderly for the same compensation as younger workers. Labor economists are particularly interested in the relationship of productivity and age because it can help test alternative theories of the labor market.

This paper assumes risk-neutral employers and estimates the age-productivity relationship using the first-order condition that the present expected value of total compensation equals the present expected value of productivity. Workers hired at different ages have different present expected values of productivity. Hence, if one parameterizes the age-productivity relationship, then it can be identified from information on how total present expected compensation varies with age.

The study uses earnings histories for over 300,000 employees of a *Fortune* 1000 corporation from 1969 to 1983. While the results may be subject to several biases and should be viewed cautiously, they are fairly striking. For each of the five sex-occupation groups, productivity falls with age. For young workers, compensation (earnings plus pension accrual) is below productivity. For several worker groups, the discrep-

ancy between compensation and productivity is very substantial.

In addition to confirming some features of contract theory, the results support the bonding models of Becker and Stigler and Lazear that suggest that firms use the age-earnings profile as an incentive device.

## **Substitution Over Time in Work and Consumption**

**Robert E. Hall**  
Working Paper No. 2789  
December 1988  
JEL Nos. 131, 824

Sir John Hicks's *Value and Capital* provided the theoretical foundation for an important element of modern macroeconomics. Intertemporal substitution—deferral or acceleration of economic activity in response to the real interest rate and other incentives—is the mechanism generally relied upon in equilibrium theories of macroeconomics to explain the irregular evolution of the economy over time. Even theorists who question the pure market-clearing paradigm are concerned with intertemporal substitution in measuring deadweight burden of fluctuations. This paper surveys recent empirical evidence on intertemporal substitution with regard to the type of fluctuations model introduced in *Value and Capital*.

## **Notes on Credibility and Stabilization**

**Rudiger Dornbusch**  
Working Paper No. 2790  
December 1988  
JEL No. 134

Do existing theories of stabilization explain the credibility issues involved in such programs? The experience with stabilization in a hyperinflation setting in Israel and Latin America makes it worthwhile to ask how much existing theories help us to understand the success and failure of these experiments. The traditional theories typically focus on interaction between policymakers and the public, with imperfect information about the true nature of the government and resulting games, but this often does not help much in explaining stabilization.

First I deal with stabilization as a one-shot problem and ask what "credibility" might mean in a world where it is inconceivable that a program will succeed with perfect probability. The model gives the equilibrium program an ex ante probability of success and draws attention to the factors that raise or lower that probability of success. Next I deal with the problem of waiting, which is familiar from the option literature and from recent international applications. I show that in the immediate aftermath of stabilization, it is very difficult to persuade the public to repatriate assets and

engage in irreversible investment except at a large premium. However, generating that premium is politically difficult.

## **The Japanese Tax Reform and the Effective Rate of Tax on Japanese Corporate Investments**

**John B. Shoven**  
Working Paper No. 2791  
December 1988  
JEL No. 323

Japan is in the midst of reforming its national individual and corporate income tax systems. Last year it abandoned its system of tax-free savings accounts and lowered individual marginal tax rates. A much more radical proposal currently is being advocated by the government and is well along the way toward passage in the Diet. The new proposal would lower the statutory rate for the corporation income tax significantly, lower individual rates further while increasing the tax thresholds, tax capital gains on securities for the first time, and introduce a type of value-added tax. As a package, this would be the most important change in the Japanese tax system since 1950.

This paper briefly summarizes the Japanese income tax system and the changes that have been enacted or proposed. It also discusses and evaluates the pressures for reform, both domestic and international. Finally, the paper looks at how the taxation of capital income in Japan has changed since 1980 and how it compares to the U.S. taxation of capital income after our 1986 tax reform.

One major finding is that the effective marginal tax rate on corporate capital income in Japan has increased sharply since 1980, from roughly 5 percent to about 32 percent. This change, which still leaves the marginal taxation on corporate investments somewhat lower in Japan than in the United States, is caused both by changes in the Japanese tax code and by the virtual elimination of inflation in Japan.

## **Retrospective Capital Gains Taxation**

**Alan J. Auerbach**  
Working Paper No. 2792  
December 1988  
JEL Nos. 320, 520

This paper presents a new approach to the taxation of capital gains that eliminates the deferral advantage present under current realization-based systems, along with the lock-in effect and tax arbitrage possibilities associated with this deferral advantage. The new approach also taxes capital gains only upon realization



but, by effectively charging interest on past gains when realization finally occurs, eliminates the incentive to defer such realization. Unlike a similar scheme suggested by Vickrey, the present one does not require knowledge of the potentially unobservable pattern of gains over time. Thus it is applicable to a very broad range of capital assets.

### **Inflation, Index-Linked Bonds, and Asset Allocation**

**Zvi Bodie**

Working Paper No. 2793

December 1988

JEL No. 520

The recent introduction by several financial institutions of bonds linked to the Consumer Price Index (CPI) is a milestone in the history of the U.S. financial system. It has potentially far-reaching effects on individual and institutional asset allocation decisions because these securities represent the only true long-run hedge against inflation risk.

CPI-linked bonds make possible the creation of additional financial innovations that would use them as the asset base. One such innovation that seems likely is inflation-protected retirement annuities. The introduction of index-linked bonds eliminates one of the main obstacles to the indexation of benefits in private pension plans. A firm could hedge the risk associated with a long-term indexed liability by investing in index-linked bonds with the same duration as the indexed liabilities.

### **The Baby Boom, the Baby Bust, and the Housing Market**

**N. Gregory Mankiw and David N. Weil**

Working Paper No. 2794

December 1988

JEL Nos. 130, 841

This paper examines the impact of major demographic changes in the housing market in the United States. The entry of the baby boom generation into its house-buying years was the major cause of the increase in real housing prices in the 1970s. Since the baby bust generation is now entering its house-buying years, housing demand will grow more slowly in the 1990s than at any time in the past 40 years. If the historical relationship between housing demand and housing prices continues into the future, real housing prices will fall substantially over the next two decades.

### **Mean Reversion in Stock Prices? A Reappraisal of the Empirical Evidence**

**Myung Jig Kim, Charles R. Nelson, and Richard Startz**

Working Paper No. 2795

December 1988

JEL No. 310

Recent research, based on variance ratios and multiperiod-return autocorrelations, concludes that the stock market exhibits mean reversion. That is, an above-average return tends to be followed by partially offsetting returns in the opposite direction. Dividing history into pre-1926, 1926-46, and post-1946 subperiods, we find mean reversion characterizes 1926-46, but not post-1946, which exhibited persistence of returns. The evidence for pre-1926 is mixed. Therefore, we conclude that evidence of mean reversion in U.S. stock returns is substantially weaker than reported in the recent literature. If mean reversion continues to be a feature of the stock market, then the experience of the past 40 years has been an aberration.

### **The Effectiveness of Foreign Exchange Intervention: Recent Experience**

**Maurice Obstfeld**

Working Paper No. 2796

December 1988

JEL No. 431

Since the September 1985 Plaza Hotel announcement by the Group of Five industrial countries, there has been a substantial realignment of exchange rates. At the same time, foreign exchange market intervention, much of it concerted and much of it sterilized, has been undertaken on a scale not seen since the early 1970s. This paper takes a fresh look at the effectiveness of sterilized intervention in the light of recent experience.

The paper concludes that sterilized intervention, in itself, has not been important in promoting exchange rate realignment. Instead, clear shifts in patterns of monetary and fiscal policy appear to have been the main medium-term policy factors determining currency values. Over certain shorter time periods, intervention has influenced exchange markets through a signaling channel. However, this signaling effect has operated only because authorities frequently are ready to adjust monetary policies promptly to counteract unwelcome exchange market pressures.

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