NBER Reporter

Program Report

Labor Studies

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NBER's Program in Labor Studies seeks to analyze substantive labor market problems in the areas of compensation; employment and unemployment; the behavior of individuals supplying labor; the economic problems of distressed groups, notably minorities and youth; unionism; and social insurance programs that affect the labor market. The work has evolved along three broad dimensions: some researchers have been concerned with development of data and discovery of facts regarding the changing state of the labor market; others have sought to develop theories designed to elucidate market outcomes; still others have worked to expand and improve the econometric tools needed for data analyses. It is through the combination of these strands of work that the Program in Labor Studies hopes to advance our understanding of the operation of labor markets and of the effect of major institutions on market performance.

Since the Fall 1980 *NBER Reporter*, in which I last reported on the program, several projects have been completed, new researchers have joined the program, and new projects have been initiated. *The Youth Labor Market Problem* (edited by Richard Freeman and David Wise), containing the results of NBER work on that important topic, and *Studies in Labor Markets* (edited by Sherwin Rosen), dealing with a variety of labor market issues, have both been published by the University of Chicago Press. Work by NBER researchers on trade unionism has contributed to the revived interest in the economics of unionism. In the area of labor supply, progress has been made on the econometric methodology best suited to analyze longitudinal as well as cross-sectional data sets; empirical work has focused on retirement decisions as well as traditional issues of female participation and human capital. Several researchers have contributed to the theory of labor contracts and employment fluctuation. Finally, there has been significant research effort in two areas of broad social concern: minority economic status,

This issue of the *Reporter* highlights the Bureau's Program in Labor Studies. Next, Jeffrey Sachs discusses his work on international capital markets. Then, Willem H. Buiter describes his studies of stabilization policy. After the quarterly Economic Outlook Survey, are a section of biographical sketches and news of NBER conferences, the Conference Calendar, and other NBER news and reports. The *Reporter* concludes with short summaries of recent NBER Working Papers.

and the labor market consequence of social insurance programs, notably the minimum wage.

Social Insurance and Labor Supply

Because of the changing role of social insurance programs in the U.S. economy and increased recognition of their impact on both the demand and supply of labor, considerable research activity has been devoted to social insurance issues. In the 1980–82 period, many Bureau researchers examined the effect of minimum wages on the labor market. David Wise and Robert Meyer developed a new method for using entire earnings distributions to infer the effects of the minimum wage on the employment and earnings of young persons. Daniel Hamermesh examined time-series data regarding the impact of the minimum wage on employment. Jacob Mincer developed a general analysis of economic re-

sponses to wage floors, which included turnover and training responses. Richard Freeman, Wayne Gray, and Casey Ichniowksi constructed a new data set to analyze the use and effects of the student subminimum wage, while John Boschen and Herschel Grossman looked at the effects of the minimum on various industries and demographic groups. The work of Bureau and other researchers has been usefully summarized in papers by Charles Brown, Curtis Gilroy, and Andrew Kohen. What emerges from this body of research is widespread support for the general proposition that the minimum wage has adverse effects on the employment position of young workers but that these effects are moderate or modest, not enormous, depending on one's point of view.[1]

A growing area of analysis that involves both social insurance and labor supply relates to the retirement decision. Alan Gustman and Thomas Steinmeier have pointed out that individuals must choose between working full time or not at all on their main job, or working part time outside of their old job while partially retired. They have estimated models reflecting responses to these choices. Olivia Mitchell and Gary Fields have engaged in extensive work on the effects of pensions and earnings on retirement using data from a major pension program. Gary Burtless and Jerry Hausman have found that financial and nonfinancial incentives have economically sensible effects on the retirement choice of federal civil servants. Victor Fuchs's work on retirement provides strong support for the role of ill health in the labor force behavior of older men and shows that the self-employed are more likely than others to keep working.[2]

In other work in the labor supply areas, Reuben Gronau has studied the effects of wives' labor participation on income in Israel. Tom MaCurdy's analysis of data from

[1] D. A. Wise and R. H. Meyer, "Discontinuous Distributions and Missing Persons: The Minimum Wage and Unemployed Youth," NBER Working Paper No. 711, July 1981, and "The Effects of the Minimum Wage on the Employment and Earnings of Youth," NBER Working Paper No. 849, January 1982; D. S. Hamermesh, "Minimum Wages and the Demand for Labor," NBER Working Paper No. 656, April 1981; J. A. Mincer, "The Economics of Wage Floors," NBER Working Paper No. 804, November 1981; R. B. Freeman, W. Gray, and C. Ichniowski, "Low-Cost Student Labor: The Use and Effects of the Subminimum Wage Provisions for Full-time Students," NBER Working Paper No. 765, September 1981; J. F. Boschen and H. I. Grossman, "Employment Effects of the Federal Minimum Wage," NBER Working Paper No. 812, December 1981; C. Brown, C. Gilroy, and A. Kohen, "Time-Series Evidence of the Effect of the Minimum Wage on Youth Employment and Unemployment," NBER Working Paper No. 790, October 1981, and "The Effect of the Minimum Wage on Employment and Unemployment: A Survey," NBER Working Paper No. 846, January 1982; and M. Eccles and R. B. Freeman, "What! Another Minimum Wage Study?" NBER Working Paper No. 878, April 1982.

[2] A. L. Gustman and T. L. Steinmeier, "Partial Retirement and the Analysis of Retirement Behavior," NBER Working Paper No. 763, September 1981; O. S. Mitchell and G. S. Fields, "The Effects of Pensions and Earnings on Retirement: A Review Essay," NBER Working Paper No. 772, September 1981, and "Economic Determinants of the Optimal Retirement Age: An Empirical Investigation," NBER Working Paper No. 876, April 1982; G. Burtless and J. A. Hausman, "'Double Dipping': The Combined Effects of Social Security and Civil Service Pensions on Employee Retirement," NBER Working Paper No. 800, November 1981; and V. R. Fuchs, "Self-Employment and Labor Force Participation of Older Males," NBER Working Paper No. 584, November 1980.

the Denver Income Maintenance Experiment has suggested that negative income taxes have larger disincentive effects on work than are normally found.[3]

In general, while there are aberrant estimates, the labor supply research suggests that social welfare programs and taxation have the deterrent effects on work effort predicted by economic analysis. However, the response elasticities are, in general, moderate or modest for men but potentially large for women.[4]

Econometric Methodology

The major data innovation in recent years has been the advent of longitudinal or panel data on individuals, which enables researchers to follow the same person over time. The data permit analysis of career patterns, of overtime substitutions of labor supply, and of comparisons of the same person under different economic conditions. Bureau researchers have been in the forefront in developing tools for analyzing these forms of data.

Gary Chamberlain has examined models with a latent variable reflecting an individual effect and has shown that lags and trends observed in data could have been generated by the unobserved individual effect rather than true time dependence. His work has been applied to union wage effects and labor participation.[5]

Tom MaCurdy has analyzed the ability of standard time-series models to be generalized for panel data under various assumed-error and lag structures. His work considers simultaneous equation systems in which endogenous variables are related not only to one another and to exogenous variables but also to lagged variables in a dynamic framework.[6]

James J. Heckman and Christopher Flinn have focused on econometric methods of analyzing individual career patterns, allowing for unobserved individual effects, time-varying explanatory variables, and duration dependence. They have also analyzed models of job search and their work has been applied to unemployment and out-of-the-labor-force behavior. In the Young Men's National Longitudinal Survey, they find evidence that "out of the labor force" and "unemployment" are distinct states. Heckman and MaCurdy have also written a useful survey of some of the new methods for estimating labor-supply functions.[7]

In a related strand of research, Jerry Hausman has concentrated on the effect of nonlinear budget constraints on analyses of labor supply. The nonlinear constraints alter the nature of the error structure and thus require new techniques. This work has been applied to the determinants of female labor supply. This body of work has shown the problems of applying traditional statistical methodology to panel data, and it offers some competing models for aiding empirical analysis of the new data.[8]

Unionism

Research on trade unionism, which was dormant for many years, has been a major area of Bureau activity, with work on the nonwage and wage effects of unions, and on internal union and company policies, yielding new facts and interpretations of what unions do.

With respect to wage issues, H. Gregg Lewis is continuing his review of recent studies of the effects of unions on the relative wage structure of the United States, while Richard Freeman has completed a study showing the dispersion of wages to be lower in unionized establishments. George Johnson has documented a rise in the union wage premium over time. Several researchers are examining wage effects with panel data using the new econometric tools.[9]

Studies of the nonwage effect of unionism have yielded several important results: seniority exerts greater importance on within-firm mobility under unionism (but not on wages); the volume of training is smaller under unionism; union workers are more stable employees; profit rates are lower under unionism; productivity in some but not all settings appears to be higher under unionism for reasons beyond higher capital/labor ratios; black workers have a much greater desire to join unions than white workers. As part of the study of nonwage effects and of company personnel policy in general, James Medoff and Katharine Abraham surveyed several hundred firms. Their findings reveal that seniority is important in a majority of establishments but has a greater impact on decisionmaking under unionism.[10]

[3]R. Gronau, "Wives' Labor Force Participation, Wage Differentials, and Family Income Inequality: The Israeli Experience," NBER Working Paper No. 668, April 1981; T. E. MaCurdy, "An Intertemporal Analysis of Taxation and Work Disincentives: An Analysis of the Denver Income Maintenance Experiment," NBER Working Paper No. 624, January 1981.

[4]O. S. Mitchell, "The Labor Market Impact of Federal Regulation: OSHA, ERISA, EEO, and Minimum Wage," NBER Working Paper No. 844, January 1982.

[5]G. Chamberlain, "Panel Data," NBER Working Paper No. 913, June 1982.

[6]T. E. MaCurdy, "Multiple Time-Series Models Applied to Panel Data," NBER Working Paper No. 646, March 1981.

[7]J. J. Heckman and C. J. Flinn, "New Methods for Analyzing Structural Models of Labor Force Dynamics," NBER Working Paper No. 856, February 1982, and "Models for the Analysis of Labor Force Dynamics," NBER Working Paper No. 857, February 1982; J. J. Heckman and T. E. MaCurdy, "New Methods for Estimating Labor Supply Functions: A Survey," NBER Working Paper No. 858, February 1982.

[8]J. A. Hausman, "Stochastic Problems in the Simulation of Labor Supply," NBER Working Paper No. 788, October 1981.

[9]R. B. Freeman, "Union Wage Practices and Wage Dispersion within Establishments," NBER Working Paper No. 752, September 1981.

[10]J. L. Medoff and K. G. Abraham, "The Role of Seniority at U. S. Work Places: Some New Evidence," NBER Working Paper No. 618, January 1981, and J. A. Mincer, "Union Effects: Wages, Turnover, and Job Training," NBER Working Paper No. 808, November 1981.

Richard Freeman and James Medoff have reviewed many of the new findings on trade unionism and have sought to evaluate the usefulness of econometric "systems techniques" for analyzing both wage and nonwage effects of unionism. Their conclusion: the techniques yield inconsistent results because of problems of model specification and extreme sensitivity to small changes in data or in equations.[11]

The internal operation of unions has a long history in labor economics, stretching back at least to John Dunlop's classic *Wage Determinations under Trade Unionism*. John Pencavel has been working in this area, examining the trade-off between wages and employment in the trade union objective function. His analysis, focusing on the International Typographical Union, reveals that the elasticity of substitution between wages and employment is below unity for unions, implying restricted opportunities for trading off wages for employment. His work may lead others to evaluate the objectives and internal decisionmaking process of specific unions.[12]

New work has begun in two areas: the changing unionization of the United States, and the effect of unions in the public sector. With respect to unionization, Henry Farber has been estimating queueing models of the determination of union status of workers and is beginning to develop models of determination of the extent of unionization by industry and region. Richard Freeman and James Medoff have begun to analyze the decline in the percentage of private sector workers who are organized. Work by Glenn Fine and David Ellwood has suggested that Right-to-Work laws have a greater impact on the extent of new organization of workers than was previously believed.[13]

In the area of public-sector unionism, Ronald Ehrenberg and Joshua Schwarz have begun working on the effect of unions on productivity in the public sector, taking libraries as their first example. Casey Ichniowski analyzed police strikes in states with and without collective bargaining laws and found that compulsory arbitration provisions significantly reduce strike propensities. Ichniowski, Freeman, and Harrison Lauer have found that the overall organization strength in a state, rather than organization of a municipality per se, affects police wages, implying greater "spillover" of wages among police than among workers in the private sector. Ichniowski and Freeman are now analyzing the effect of various public sector bargaining laws on unionization across states.[14]

There are two competing perspectives on unionism in the Bureau work. One treats unions largely as monopoly-type organizations. In this perpective, Edward Lazear has developed a "competitive theory of monopoly unionism" in the context of life-cycle behavior. The other analysis treats unions as more complex institutions in the context of industrial relations. The interplay between the two perspectives has proved fruitful in advancing our knowledge of what unions do.[15]

Troubled Workers: Minorities and Others

One of the major economic issues in the U.S. labor market in recent years has been the changing economic status of minority workers. It is now generally agreed that while some minority workers have enjoyed substantial gains in the past two decades, others—particularly inner-city youth—have not. NBER researchers at several institutions have been examining the extent, nature, and possible causes of both the improvement and the lack of improvement in the position of minority workers in the labor market.

As part of this effort, a survey questionnaire covering some 2400 inner-city youths was administered for NBER by Mathematica Policy Research, Inc. The questionnaire asked detailed information on labor market behavior, income sources, allocation of time, and social problems, such as crime, and alcohol and drug use. Harry Holzer has been engaged in an extensive analysis of job search patterns in the data. One interesting finding from his work is that the reservation wages of unemployed youth remain well above the minimum wage, and their search effort is limited, even after they have experienced lengthy periods of unemployment. John Ballen has examined the duration dependence of unemployment and employment in the same data set, finding that for the inner-city black youth, job tenure does not reduce chances of unemployment later to the extent that it does for other groups. Richard Freeman has been studying the factors underlying which inner-city youth actually succeed in the market: religion turns out to be a key factor, as does success of other family members.[16]

In related work, John Cogan has analyzed the decline in black teenage employment, 1950–70, developing the first fruitful explanation of the worsened position of the youth: that it reflects in part the decline in southern agriculture and in part expanded coverage of the minimum wage. Harry Holzer has demonstrated that in highly unionized cities, black youth who are not union members have fewer job opportunities than in less unionized cities, presumably as a result of the increased supply of labor in the nonunion sector.[17]

[11] R. B. Freeman and J. L. Medoff, "The Impact of Collective Bargaining: Can the New Facts Be Explained by Monopoly Unionism?" NBER Working Paper No. 837, January 1982.

[12] J. H. Pencavel, "The Trade-Off between Wages and Employment in Trade Union Objectives," NBER Working Paper No. 870, March 1982.

[13] R. B. Freeman and J. L. Medoff, "The Impact of Collective Bargaining: Illusion or Reality?" NBER Reprint No. 258, April 1982.

[14] R. E. Ehrenberg and J. L. Schwarz, "The Effects of Unions on Productivity in the Public Sector: The Case of Libraries," NBER Working Paper No. 717, July 1981; and C. Ichniowski, "Collective Bargaining and Compulsory Arbitration: Prescriptions for the Blue Flu," NBER Working Paper No. 769, September 1982.

[15] E. P. Lazear, "A Competitive Theory of Monopoly Unionism" NBER Working Paper No. 672, May 1981.

[16] R. B. Freeman, "Troubled Workers in the Labor Market," NBER Working Paper No. 816, December 1981.

[17] J. F. Cogan, "The Decline in Black Teenage Employment: 1950-1970," NBER Working Paper No. 683, May 1981; and H. J. Holzer, "The Impact of Unions on the Labor Market for White and Minority Youth," NBER Working Paper No. 633, February 1981.

Charles Brown and Jonathan Leonard have studied the effects of federal antidiscrimination activity on the progress of blacks in the economy. Brown found that federal activity is the only viable explanation of the overall improvement in black/white earnings ratios since the Civil Rights Act of 1964. Leonard's analysis of individual establishment data shows that establishments that are federal contractors have had much larger increases in black employment, particularly in better jobs, than noncontractor establishments. He also shows that establishments facing compliance reviews have greater increases in black employment than contractor establishments that do not face the pressure of a review.[18]

Casey Ichniowski's analysis of the impact of the 1973 steel industry consent decree also finds a role for national policy, with black representation in trade and craft jobs rising more rapidly in the four-year period after the decree than pre-1974 trends would have predicted. Richard Freeman has examined and rejected the claim that the black labor gains of the past two decades are transitory but has shown that the rough parity of wages between the youngest cohorts of black and white workers does indeed exaggerate the extent to which permanent equality has been attained.[19]

Overall, two themes emerge from the various studies. First, there is evidence that antidiscriminatory policy has improved the economic status of black workers in general but that the gains are unevenly distributed among workers. Second, the minimum wage, and possibly other economic developments and policies, have adversely affected inner-city minority youth, whose position constitutes a major problem in the labor market.

Wages and Human Capital

Work on wages and human capital, two of the main subjects of the "new labor economics," has followed both theoretical and empirical routes. In the area of theory, several researchers have been working on optimal wage contracts. Sherwin Rosen has analyzed inequalities in the upper tail of the income distribution and the hierarchical structure of production. Edward Lazear has examined the role of pensions and severance pay in lifetime compensation, arguing that pensions serve as an efficient severance pay device.[20]

Jonathan Eaton and Harvey S. Rosen have analyzed delayed compensation of top executives in the context of agency theory; Ariel Pakes and Shmuel Nitzan have explored the optimum labor policy for employment of scientists, given the fact that the scientist may be able to use information acquired during a project in a rival enterprise. All of these studies can be viewed as part of the new theory of labor contracts that has come to replace the simplistic view that the labor contract is a simple sales contract; the new theory provides a more realistic basis for understanding actual market wage and employment patterns.[21]

In the empirical work, Eric Seiler has provided a comprehensive analysis of piece-rate pay, showing that the dispersion and level of pay is higher under piece rates than time rates. He interprets this in part as reflecting the impact of incentives on individual performance and in part as a "risk premium" for engaging in piece work.[22]

Richard Freeman has continued his analysis of the changing economic value of higher education, finding that the heralded decline in the return to investing in college has not been reversed in the late 1970s, and that the decline characterizes Western Europe, Japan, and other OECD countries as well as the United States. Steven Venti and David Wise have focused on the role of test scores in individuals' attendance at college. Their major finding is that individual self-selection, related to both measured and unmeasured personal attributes, is the dominant determinant of college attendance. Controlling for test scores and other factors, they find that blacks are *more* likely to attend college than whites.[23]

Alan Gustman and Thomas Steinmeier's work has dealt with the economic outcomes of vocational training in high school. They find little effect of such training on the success of male students but some evidence that commercial-business programs may have produced valued skills for women, at least in the early 1970s.[24]

[18]C. Brown, "Black/White Earnings Ratios since the Civil Rights Act of 1964: The Importance of Labor Market Drop-Outs," NBER Working Paper No. 617, January 1981, and "The Federal Attack on Labor Market Discrimination: The Mouse That Roared?" NBER Working Paper No. 669, May 1981.

[19]C. Ichniowski, "Have Angels Done More? The Steel Industry Consent Decree," NBER Working Paper No. 674, May 1981; and R. B. Freeman, "Have Black Labor Market Gains Post-1964 Been Permanent or Transitory?" NBER Working Paper No. 751, September 1981.

[20]E. P. Lazear, "Severance Pay, Pensions, and Efficient Mobility," NBER Working Paper No. 854, February 1982.

[21]J. Eaton and H. S. Rosen, "Agency, Delayed Compensation, and the Structure of Executive Remuneration," NBER Working Paper No. 777, October 1981; A. Pakes and S. Nitzan, "Optimum Contracts for Research Personnel, Research Employment, and the Establishment of 'Rival' Enterprises," NBER Working Paper No. 871, March 1982.

[22]E. Seiler, "Piece Rate versus Time Rate: The Effect of Incentives on Earnings," NBER Working Paper No. 879, April 1982.

[23]R. B. Freeman, "Implications of the Changing U.S. Labor Market for Higher Education," NBER Working Paper No. 697, June 1981, "Career Patterns of College Graduates in a Declining Job Market," NBER Working Paper No. 750, September 1981, and "The Changing Economic Value of Higher Education in Developed Economies: A Report to the O.E.C.D.," NBER Working Paper No. 820, December 1981; and S. Venti and D. A. Wise, "Test Scores and Self-Selection of Higher Education: College Attendance versus College Competition," NBER Working Paper No. 709, July 1981, and "Test Scores, Educational Opportunities, and Individual Choice," NBER Working Paper No. 710, July 1981.

[24]A. L. Gustman and T. L. Steinmeier, "The Relation between Vocational Training in High School and Economic Outcomes," NBER Working Paper No. 642, March 1981.

Macroeconomics of the Labor Market

In labor economics, as elsewhere, the stagflation of the 1970s has led researchers to focus on macroeconomic developments in an effort to understand changing market realities. Several NBER researchers have focused on observed employment, unemployment, and wage patterns, asking whether they are consistent with rational expectations/perfect market-clearing models. James Brown concluded that the labor market differs from an auction market in the short run in both employment and wages.[25]

Joseph Altonji's analysis of time-series data has found that most unemployment cannot be interpreted as the result of intertemporal substitution of leisure over time. Using several different econometric models to proxy rational expectations, his results are almost uniformly consistent with the view that unemployment is not a matter of choice.

In an empirical analysis of compensation growth in the United States, James Medoff and Katharine Abraham have offered a new intepretation of the shifting Phillips curve. They find that various measures of unsatisfied labor demand offer a more stable and better explanation of wage changes than does unemployment. One reason for the shifting Phillips curve is the shift in the link between unsatisfied demand and unemployment in recent years. Allen Drazen, Daniel Hamermesh, and Norman Obst have provided some evidence that the elasticity of demand for labor falls in periods of economic decline, exacerbating the problem of restoring full employment.[26]

Robert Hall and Edward Lazear have developed a valuable link between labor market macrodynamics and theories of labor contracts. Given that worker–firm relations are in effect for relatively long periods of time, producing situations of bilateral monopoly, they show that no single labor contract offers a feasible solution to the macroeconomic problem of business-cycle swings in labor demand.[27]

If there is a single message from these studies, it is that the macroeconomics of determining wages and allocating labor are indeed complex and not properly captured by the theories currently prevailing. We hope that the work of NBER researchers in labor will help contribute to the development of a macroeconomics of the labor market that is consistent with the actual functioning of the economy.

[25] J. N. Brown, "How Close to an Auction is the Labor Market? Employee Risk Aversion, Income Uncertainty, and Optimal Labor Contracts," NBER Working Paper No. 603, December 1980.

[26] J. L. Medoff and K. G. Abraham, "Unemployment, Unsatisfied Demand for Labor, and Compensation Growth in the United States, 1965-1980," NBER Working Paper No. 781, October 1981; A. Drazen, D. S. Hamermesh, and N. Obst, "Quantity and Elasticity Spillovers onto the Labor Market: Theory and Evidence on Sluggishness," NBER Working Paper No. 676, May 1981.

[27] R. E. Hall and E. P. Lazear, "The Excess Sensitivity of Layoffs and Quits to Demand," NBER Working Paper No. 864, February 1982.

Research Summaries

International Capital Markets

Jeffrey Sachs

The international capital markets provided many of the macroeconomic surprises of the past decade. The years since 1970 have been marked by burgeoning debt of less developed countries (LDCs), unprecedented current account deficits in many developed countries, and widely fluctuating exchange rates among the major industrial economies. The international loan markets themselves have changed in character as well as size, particularly with the remarkable rise in LDC access to large syndicated bank loans.

These developments continue to puzzle economists and preoccupy policymakers. It is clear, for example, that the surge in bank lending to LDCs represents both substantial benefits and risks. Fueled by foreign borrowing, the middle-income LDCs were able to maintain high growth rates throughout the 1970s, in spite of the growth slowdown in the OECD countries. Middle-income LDCs experienced real GNP growth of 5.6 percent per annum during 1970–80, little reduced from the 6.2 percent rate of the previous decade, in large part because of high domestic investment rates sustained by foreign borrowing. But the massive accumulation of international indebtedness is also leading to debt crises, as with Poland today, which could threaten the international financial system. The medium- and long-term debt of the nonoil LDCs increased from about $75.9 billion in 1972 to $299 billion in 1979. The number of debt reschedulings has soared as well in recent years: 22 since 1975.

In some recent papers, I have tried to develop economic models that can assess these developments.[1] The first goal of these papers is to model the basic determinants of current account imbalances and international borrowing and to verify these factors empirically. The second goal is to explain how the risks in international lending, particularly the risks of default by sovereign borrowers, affect the structure and performance of the international loan market.

The analyses share a common theme. International borrowing (or its counterpart: a current account deficit) increases an economy's current resources, but *only* at the cost of *future resources*. Debt problems arise not

[1] Some of these papers include J. Sachs, "LDC Debt in the 1980s: Risk and Reforms," NBER Working Paper No. 861, February 1982, "Aspects of the Current Account Behavior of OECD Economies," NBER Working Paper No. 859, February 1982, "The Current Account in the Macroeconomic Adjustment Process," NBER Working Paper No. 796, November 1981, and "The Current Account and Macroeconomic Adjustment in the 1970s," Brookings Papers on Economic Activity, 1981:1; and D. Cohen and J. Sachs, "LDC Borrowing with Default Risk," NBER Working Paper No. 925, July 1982.

from the size of current borrowing but from the expectation that future resources will be inadequate to pay off the debt. Countries that invest heavily can safely borrow heavily; future resources will be available for debt servicing. Countries that invest very little do not generate the future income to pay off large debts and so are more limited in their scope for borrowing. Thus a given current account balance may be modest or "unsustainable," depending on national savings and investment rates, and future prospects for national output. All evaluations of deficit finance must start from this intertemporal perspective.

Formal Models of International Borrowing

There has been a recent surge in interest in the "intertemporal" approach to current account analysis, which can be found in the work of NBER Research Associates Obstfeld, Dornbusch, Bruno, and others.[2] In my own work I have combined the life-cycle theory of savings, the theory of optimal investment plans, and the assumption of international capital mobility, to formulate models of the current account and international borrowing.[3] Various hypotheses emerge from this work:

(1) We should expect *temporary* declines in national income to lead to larger current account deficits than *permanent* declines in national income. When shocks are transitory, optimizing households reduce savings rates in order to smooth consumption. There is less incentive, if any, to reduce savings rates in the face of permanent reductions in income. In the words of the IMF, countries are likely to "finance" temporary shocks but "adjust" to permanent shocks.

(2) A rise in investment opportunities will probably lead to current account deficits, as firms borrow from abroad to finance the new capital formation.

(3) An anticipated increase in future income can be expected to give rise to current account deficits today, as households and the government increase consumption expenditures in anticipation of higher future income.

These principles are useful in explaining the pattern of current account deficits in the world economy after the 1973 oil price shocks, as I show in "The Current Account and Macroeconomic Adjustment in the 1970s." The standard and *incorrect* picture of the large post-1973 deficits of oil-importing countries is that when oil prices increased, oil importers borrowed to pay for higher oil bills. In this standard view, the more dependent on oil imports the economy is, the larger the deficits will be.

Hypothesis (1) warns us against this facile view. *Permanent* oil price increases do not, in themselves, lead to an incentive to borrow. Economies that are more dependent on oil imports are hurt more by the OPEC shock, but they do not necessarily borrow more abroad. Empirically, there is amazingly little correlation between dependence on oil imports and the size of current account deficits in the past decade, except in the immediate aftermath of the 1973 and 1979 oil shocks. Consider, for example, the following observations: Japan, the economy most heavily dependent on oil imports, ran among the largest surpluses after 1973; Canada, Australia, and Norway, all net exporters of energy products, ran among the largest deficits. Similarly among the LDCs, non-OPEC oil-exporting countries increased their deficits as much or more than oil-importing LDCs after 1973![4]

One reason for this counterintuitive result is given by hypothesis (1). A second reason is given by the second hypothesis. Investment opportunities were brighter in the oil-exporting economies, if for no other reason than the increased profitability of energy-related investments. Norway, for example, became the largest foreign borrower (as a percentage of GNP) among the OECD countries in the 1970s, incurring huge foreign debts to finance its North Sea oil development. Norwegian current account deficits jumped to around 10 percent of GNP for several years in the mid 1970s, as national investment rates soared.

Similar factors have been at work in the LDC debt accumulation. A popular view holds that LDC debt was accumulated in the 1970s as countries borrowed to maintain living standards in spite of the oil price increases. This type of borrowing did occur in some places, but apparently not as the rule. Higher LDC borrowing did not reflect lower national savings rates in those countries, but rather higher investment rates. In fact, as a group, the major middle-income developing countries actually had *increases* in savings rates in the 1970s, as well as large increases in investment rates.[5]

Deficits and Default Risk

So far, I have pointed out only one of two reasons why countries did not borrow internationally to pay for higher oil bills. According to the basic theory, households and governments are unlikely to borrow to pay for *permanent* shocks to income. A second reason for not observing such behavior is that many countries (specifically, the governments of such countries) cannot borrow for such a purpose, because of rationing in the loan market. Borrowers are rationed when the probability of debt repayment becomes too low and countries that borrow to

[2]M. Obstfeld, "Transitory Terms-of-Trade Shocks and the Current Account: The Case of Constant Time Preference," NBER Working Paper No. 834, January 1982; R. Dornbusch, "Real Interest Rates, Home Goods, and Optimal External Borrowing," NBER Working Paper No. 779, October 1981; and M. Bruno, "Adjustment and Structural Change under Supply Shocks," NBER Working Paper No. 814, December 1981.

[3]See, in particular, NBER Working Papers No. 796 and No. 859.

[4]The data are in "The Current Account and Macroeconomic Adjustment in the 1970s," p. 208. For oil-importing LDCs, the current account deficit rose from 1.9 percent of GNP in 1973 to 3.7 percent in 1976. For non-OPEC, oil-exporting LDCs, the deficit/GNP ratio went from 2.9 percent in 1973 to 4.9 percent in 1976.

[5]See "The Current Account and Macroeconomic Adjustment in the 1970s" for some data on this point.

maintain excessive current levels of consumption become prime targets for quantity rationing.

In two recent papers (NBER Working Papers No. 861 and No. 925), I consider the nature of quantity rationing in the international loan markets. International borrowing, particularly by foreign governments, is difficult to enforce. Foreign governments have the option to repudiate their debts in a way that domestic corporate borrowers do not, since corporations can be put into bankruptcy after a debt repudiation, while foreign governments typically cannot. Also, foreign governments have more leeway to undermine the value of claims against them (for example, by pursuing insufficient investment activity) than do corporate borrowers, who are often bound by enforceable loan covenants that require certain types of behavior.

A loan to an LDC sovereign borrower must therefore pass two tests. First, will the economy have the future resources available to service the debt? Second, will the borrower choose to honor the debt? The first test leads to rationing based on a wealth constraint: an economy cannot borrow more than the value of its future income stream. The second test leads to borrowing limits based on the costs and benefits of default. If a government can safely default with little cost, then banks will be willing to extend only low levels of debt; if default is very costly, then large amounts of debt can safely be extended, for the likelihood of default is low.

In the analysis with Daniel Cohen (NBER Working Paper No. 925), we argue that several aspects of the international loan market are strongly shaped by the possibility of default. First, there is widespread quantity rationing in the loan market (according to the conventional assessment of market participants, and the evidence from debt rescheduling exercises). Second, LDC governments pursue policies designed to enhance "creditworthiness" (by which we mean the capacity to secure new loans). Third, debt maturities tend to be relatively short in the syndicated loan market.

In the theoretical model of default risk, we show that the limit on loans to a sovereign borrower depends on at least three factors: (1) the penalties that creditors can impose in the event of a default (the higher the penalties, the higher the lending limits); (2) the importance to the borrowing country of maintaining a "reputation" in the loan market, based on future borrowing needs; and (3) the extent to which foreign borrowing finances domestic investment versus current consumption. High-investing countries are better credit risks than their low-investing counterparts.

As others have pointed out, default risks give rise to quantity constraints on borrowing as well as risk premiums on the cost of loans. The ceilings on borrowing arise because high interest rates alone are not sufficient to protect creditors against the risks of default. If a debtor will choose to default at a 10 percent borrowing rate, he will choose to default at a higher rate as well. Thus there may not exist an interest rate that can compensate lenders for the risk of default.

A novel part of our analysis is to show that the short

maturities on Eurodollar loans may arise from default risk. Long-term debt obligations exist only where creditors can guard against adverse behavior by debtors for the duration of the loan. Domestic long-term debt instruments, for example, often carry covenants that block the debtors from new borrowing (or other activities) during the existing loan agreement. Such covenants do not exist (and probably are not enforceable) in the international setting. One piece of evidence for our hypothesis is that when countries approach debt crises, the maturity of their new debt tends to shrink dramatically.

Default Risk in Historical Perspective

The previous 150 years of international lending provide a fascinating tableau against which to judge the current scene. In "LDC Debt in the 1980s" (NBER Working Paper No. 861), I canvass that history, with a few key findings. First, many sovereign borrowers (including many U.S. state governments) have elected to repudiate their international debt since 1820. Episodes of extensive new loan agreements have often been followed by equally extensive defaults (for example, in the 1820s and 1920s). Optimists today should reflect on the market perception of international debt in the 1920s, as surveyed in a 1951 NBER study by Ilse Mintz: "Investors in foreign bonds [in the 1920s] had not suffered any losses for a long time; on the contrary, they had repeatedly made sizeable profits. This pleasant state came to be regarded as normal; investors assumed that the world had entered a period of permanent, defaultless prosperity."[6] Of course, the defaults on international loans in the early 1930s were the greatest in history.

Nonetheless, the incidence of debt repudiation has fallen off sharply since 1945. Since 1960, only Cuba and Ghana have repudiated their debt claims, and the Ghanese repudiation was very short-lived. It seems that, in the current system, *debt rescheduling* substitutes for default, with the result that debt crises today lead to refinancing of a country's debt, rather than a debt cancellation. According to a recent count, there have been 53 official debt reschedulings since 1956, and 22 since 1975, but almost no debt repudiations.

The debt rescheduling process has been accorded widely varying interpretations within academic and policy circles. Some claim that the reschedulings are thinly veiled defaults, in which the banks and countries put on a charade to hide bad loans. Others take the opposite view: that banks do very well in the reschedulings, pointing out that no outstanding debt is written off in a rescheduling, and that refinancing occurs at higher interest rates.

In "LDC Borrowing with Default Risk" I offer a theoretical model of rescheduling that shows both of these views

[6]. Mintz, Deterioration in the Quality of Foreign Bonds Issued in the United States, 1920–1930, *NBER General Series No. 52, Ann Arbor, MI: University Microfilms, 1951*.

to be misleading. A rescheduling is shown to occur when the debtor economy has a credible threat of default (that is, when the benefits to default exceed the costs). But a declaration of default leads to penalties against the borrower (such as seizure of its assets and the inability to conduct foreign commerce) that the borrower would like to avoid. The debtor is willing to service some but not all of its debt obligations. Thus, under a default the creditors receive nothing, while under a rescheduling, the creditors receive some or all of the interest due on outstanding debt. Creditors then prefer rescheduling to default, while debtors may be fairly indifferent.

The mechanics of rescheduling require negotiation between debtors and creditors (and typically between various classes of creditors). Cohen and I distinguish between "bank" markets and "bond" markets, according to whether such negotiation is feasible or not. We suggest that rescheduling replaced defaults after 1945 because bank loans supplanted bonds as the principal vehicle for international loans. We also show that the move from defaults to rescheduling increases the efficiency of the world economy, and that greater levels of borrowing can be sustained in a "bank" market regime.

Stabilization Policy

Willem H. Buiter

Stabilization policy is currently quite unfashionable. Two economic developments—the worsening muddle of the late 1960s and the 1970s, and developments in economic theory such as the rational expectations and New Classical Macroeconomics (NCM) revolution—have seriously undermined neo-Keynesian optimism about the ability of governments to achieve superior combinations of output, employment, inflation, and external balance through the judicious manipulation of fiscal, monetary, and incomes policies. "Fine tuning," the sensitive response of monetary and fiscal instruments to even minor disturbances in economic activity, has acquired an especially bad name. My current research is motivated by the conviction that after being oversold in the 1960s, stabilization policy is currently being undersold. The self-equilibrating tendencies of modern mixed economies are not so strong that a well-designed stabilization program or set of rules might not be helpful.

The boundary between stabilization policy, a traditional concern of macroeconomics, and allocative or structural policy, the province of public finance with its predominantly microeconomic orientation, is becoming increasingly blurred, reflecting the modern concern with sound microeconomic foundations for macroeconomic behavioral relationships. Put very simply, stabilization policy concerns policy actions aimed at influencing deviations of real economic variables such as output and

employment from their equilibrium values, while allocative policies aim to influence the equilibrium values themselves. This definition of stabilization policy has to be qualified if it is to be relevant to the class of sequential momentary equilibrium models developed by Lucas, Sargent and Wallace, and Barro, representing the NCM. Given their assumption of instantaneous market clearing through perfect price flexibility, the NCM models in one sense are always "in equilibrium." Because of uncertainty, however, the actual market-clearing outcomes will differ in general from the "full-information" equilibrium outcomes, even if expectations are formed rationally. An appropriate definition of stabilization policy in NCM models therefore would be: policies aimed at influencing deviations of real economic variables from their full information values.

A major problem, both for academic economists and for policymakers, is that it is virtually impossible, even in theory, to identify policy instruments that either have stabilization consequences or allocative effects but not both. Certainly every monetary or fiscal policy action undertaken for stabilization purposes will have allocative consequences and vice-versa. This will be obvious for such fiscal policy actions as changes in tax rates and in the level and composition of public spending on goods and services. It holds true even for such fairly "pure" stabilization policy actions as changes in the rate of growth of the money stock and changes in the government's taxation–borrowing mix for a given level and composition of exhaustive spending.

Unless public debt neutrality prevails, changes in the (lump-sum) taxation–borrowing mix will have both stabilization and allocative consequences.[1] The conditions for monetary superneutrality are equally strict. Public spending cuts aimed at the allocative objective of freeing resources for private or overseas absorption may, in a non-Walrasian world, lead to a fall in effective demand and a decline in output and employment below their equilibrium values. In spite of these arguments, there appears to be an implicit consensus that the allocative effects of monetary policy are "second order" and that cyclical changes in the taxation–borrowing mix that do not alter the steady-state debt–income ratio have allocative effects that can safely be ignored in a first approximation. If correct, this would permit a meaningful evaluation of stabilization policy "on its own."

Like all policy intervention in the economy, the case for stabilization policy has to rest ultimately on a diagnosis of market failure combined with: (1) a judgment, based on economic theory and empirical evidence, that there

[1] R. J. Barro, "Are Government Bonds Net Wealth?" Journal of Political Economy, 82, November–December 1974, pp. 1095–1117; W. H. Buiter, "Government Finance in an Overlapping Generations Model with Gifts and Bequests," in G. M. von Furstenberg, ed., Social Security versus Private Saving, Cambridge, MA: Ballinger, 1979; "'Crowding Out' of Private Capital Formation by Government Borrowing in the Presence of Intergenerational Gifts and Bequests," Greek Economic Review, 2, August 1980, pp. 111–142, and NBER Reprint No. 206; and W. H. Buiter and J. Tobin, "Debt Neutrality: A Brief Review of Doctrine and Evidence," in Social Security versus Private Saving.

exist feasible policy actions that would improve economic performance; and (2) a politico-economic judgment that such desirable policies would actually be implemented. Since the microeconomic foundations of Keynesian, or more generally, non-Walrasian quantity-constrained or rationing equilibriums are still in their infancy, the welfare implications of the finding that certain stabilization policy rules are "effective" in given classes of rather ad hoc macroeconomic models are not self-evident. It is my hope and expectation that the 1980s will see the development of a New Keynesian or Non-Walrasian Macroeconomics that will rival the New Classical Macroeconomics in analytical rigor and surpass it in relevance.

The Lucas Critique and Policy Effectiveness

Like all of macroeconomics, the academic debate over stabilization policy has benefited greatly from the sanitizing influence of the Lucas critique. Policy design and evaluation presuppose the existence of an *invariant structure*, that is, a model whose parameters will be constant under the class of changes in policy regime under consideration. Private-sector behavior is influenced both directly and indirectly by expectations of future government behavior. If, when the stochastic processes governing the authorities' behavior change, the private sector's rule for forecasting that behavior changes *pari passu* (as the rational expectations hypothesis asserts), models that ignore the link from government behavior via private expectations to private behavior are likely to forecast poorly and to be misleading guides for policy evaluation.

A necessary component of a satisfactory response to the Lucas critique is the development of solution methods or algorithms for solving rational expectations models. In two recent papers I have developed solution methods for rational expectations models that can be represented by systems of first-order linear differential equations with constant coefficients.[2] Numerical algorithms for dealing with large simultaneous systems are also available.

"Policy Effectiveness"

The Lucas critique is a perfectly general proposition. Many of its early applications, however, involved a special class of ad hoc macromodels in which the combination of a very strong version of the natural-rate hypothesis with the rational expectations postulate implied neutrality, or ineffectiveness of monetary policy: the stochastic process governing such real variables as output and employment was invariant under changes in the deterministic components of the stochastic process governing

the money supply. In a series of papers, I have investigated the robustness of this monetary-neutrality or policy-ineffectiveness proposition.[3] The conclusion that emerges is that the class of models for which alternative monetary feedback rules produce the invariant distribution functions for output, employment, and the like, is effectively the empty set. Even in market-clearing models (or models with a Sargent-Wallace type of supply function), anticipated *future* monetary policy actions (which are functions of imperfectly perceived current conditions) will alter real behavior.

I scrutinize empirical work relevant to the monetary policy effectiveness debate in two recent papers. In the first of these, I show that the empirical finding by Barro and others that past anticipated monetary growth does not have a significant effect on output and employment is quite consistent with the existence of a stabilization role for monetary feedback rules. In the second paper, I confirm the finding of Engle, Hendry, and Richard that Granger (non)causality tests are completely uninformative with regard to the issue of policy neutrality or ineffectiveness.[4]

When noninvariance prevails, policy instrument values should be set according to contingent or conditional rules. Current and future instrument values should be known functions of all "exogenous" information, that is, of all news concerning the state of the world. All open-loop rules (such as fixed growth rates for some monetary aggregate) rule out any response to new information about the state of the world and are therefore suboptimal. Economic policymaking is not a game against nature but a game between rational, forward-looking players. If a noncooperative, asymmetric, game-theoretic equilibrium concept is a reasonable approximation to real-world public sector–private sector interaction, then problems of time inconsistency are likely to arise. Optimal rules will be *time inconsistent* and *conditional:* optimal policy instrument values still must be able to respond in a known manner to news about the state of the world. Open-loop rules, such as fixed money growth rules, are both time inconsistent and, by not being "innovation contingent," suboptimal. If constitutions are required to resolve the time-inconsistency problem, the constitution should be a contingent or conditional one.

[3]W. H. Buiter, "The Macroeconomics of Dr. Pangloss: A Critical Survey of the New Classical Macroeconomics," Economic Journal, 90, March 1980, pp. 34–50; "The Role of Economic Policy after the New Classical Macroeconomics," in D. Currie, R. Nobay, and D. A. Peel, eds., Macroeconomic Analysis, London: Croom Helm, 1981, pp. 233–293, and NBER Working Paper No. 580, November 1980; "Monetary, Financial, and Fiscal Policies under Rational Expectations," IMF Staff Papers, 27, December 1980, pp. 785–813, and NBER Reprint No. 146, March 1981; and "The Superiority of Contingent Rules over Fixed Rules in Models with Rational Expectations," Economic Journal, 91, September 1981, pp. 647–670, and NBER Reprint No. 226, December 1981.

[2]W. H. Buiter, "A Note on the Solution of a Two-Point Boundary Value Problem Frequently Encountered in Rational Expectations Models," NBER Technical Working Paper No. 12, June 1981; and "Saddlepoint Problems in Continuous-Time Rational Expectations Models: A General Method and Some Macroeconomic Examples," NBER Technical Working Paper No. 20, February 1982.

[4]W. H. Buiter, "Real Effects of Anticipated and Unanticipated Money: Some Problems of Estimation and Hypothesis Testing," NBER Working Paper No. 601, December 1980; "Granger-Causality and Stabilization Policy," NBER Technical Working Paper No. 10, March 1981; and R. F. Engle, D. F. Hendry, and Y. F. Richard, "Exogeneity," forthcoming in Econometrica, 1982.

The Monetary Transmission Mechanism in the Open Economy

Under a floating exchange rate and a high degree of international capital mobility, the monetary transmission mechanism is likely to differ quite significantly from its familiar closed-economy counterpart. In a series of four joint papers with Marcus Miller and one with Donald Purvis, I extend the (real) exchange-rate overshooting hypothesis of Dornbusch and apply it to the U.K. economic experience during the first two years of the Thatcher government.[5] Central to the analysis are differential speeds of adjustment in asset markets, including the foreign exchange market, and goods or factor markets. With an efficient exchange market and sluggish wage adjustment, tight money and anticipations of future monetary tightness lead to a significant appreciation of the currency and loss of competitiveness. Reducing the rate of inflation without large transitory losses in output and employment requires additional monetary and fiscal actions to complement a reduction in the *rate of growth* of the money stock. Cuts in indirect taxes and a once-and-for-all increase in the *level* of the money stock are suitable candidates.

In a joint paper with William H. Branson, I investigate the robustness of the Mundell–Flemming analysis of monetary and fiscal policy under a floating exchange rate and perfect international capital mobility.[6] The original model is modified in three ways: (1) a direct effect of the exchange rate on the domestic price level is added; (2) external wealth adjustment through the current account is considered; and (3) rational expectations are substituted for static expectations in the foreign exchange market. The Mundell–Flemming conclusion that fiscal policy cannot affect aggregate demand must be qualified if any of the three proposed modifications are adopted.

Crowding Out and the Eventual Monetization of the Deficit

From the government budget constraint and the existence of an upper bound on the public-debt-national-income ratio, it follows, with only minor further behavioral assumptions, that the long-run rate of growth of the (base) money supply is governed entirely by the fiscal stance—the parameters of the government's spending and revenue programs, as shown by Sargent and Wallace. In a recent note, I show that the public-sector deficit criterion relevant both for "crowding out" and for the long-run rate of growth of the money stock implied by the fiscal stance is the inflation-corrected, permanent (or cyclically adjusted) government current account or consumption account deficit.[7] Correcting the measured deficit for the effect of inflation on the real value of the stock privately held, nominally denominated, interest-bearing government debt suffices to eliminate most of the large measured deficits of the United Kingdom in recent years. Further adjustments for net public-sector capital formation and for cyclical deviations of public spending and revenue from trend result in sizable inflation-corrected, permanent, public-sector, current-account surpluses.

[7]W. H. Buiter, "Comment on T. J. Sargent and N. Wallace: Some Unpleasant Monetarist Arithmetic," NBER Working Paper No. 867, March 1982.

[5]W. H. Buiter and M. Miller, "Monetary Policy and International Competitiveness," Oxford Economic Papers, 33, July 1981, Supplement, pp. 143-174, and NBER Reprint No. 251, March 1982; "Real Exchange-Rate Overshooting and the Output Cost of Bringing Down Inflation," forthcoming in the European Economic Review, 1982, and NBER Working Paper No. 749, September 1981; "Real Exchange-Rate Overshooting and the Output Cost of Bringing Down Inflation: Some Further Results," LSE, Centre for Labour Economics, Discussion Paper No. 115, February 1982; "The Thatcher Experiment: An Interim Report," Brookings Papers on Economic Activity, 1981, II, pp. 315-367; and W. H. Buiter and D. D. Purvis, "Oil, Disinflation, and Export Competitiveness," forthcoming in J. S. Bhandari and B. H. Putnam, eds., Economic Interdependence and Flexible Exchange Rates, Cambridge, MA: M.I.T. Press, 1982, and NBER Working Paper No. 592, December 1980.

[6]W. H. Branson and W. H. Buiter, "Monetary and Fiscal Policy with Flexible Exchange Rates," forthcoming in Economic Interdependence and Flexible Exchange Rates, and NBER Working Paper No. 901, June 1982.

Economic Outlook Survey

The Economic Outlook Survey: Improvements and New Studies

Victor Zarnowitz

Since 1968 the National Bureau of Economic Research has cooperated with the American Statistical Association in collecting and analyzing macroeconomic predictions from a regular quarterly survey of persons professionally engaged in economic and business forecasting. The format of the survey remained unchanged from 1968:4 through 1981:2, with forecasts on each occasion covering the current quarter and the four quarters ahead, for eleven time series representing the principal measures of national output, income, consumption, investment, the price level, and unemployment. More than 170 individuals participated in the survey at one time or another; although many responded only sporadically, a respectable number developed a regular record (for example, 79 responded to at least 12 of the 42 consecutive surveys through 1979:1).

Most of the forecasters surveyed are from the world of corporate business and finance; but academic institutions, government, consulting firms, trade associations, and labor unions are also represented. Thus the survey reaches a broadly based and diversified group of professionals. In addition to the rich information on the record of the numerical predictions for the eleven variables, from the onset the surveys have collected unique data on the methods and assumptions used by the respondents and on the probabilities they attach to alternative prospects concerning changes in output and prices. The overall results are reported each quarter by NBER and ASA.[1]

A number of studies have used averages and, to a much lesser extent, dispersion and other aspects of the survey forecasts.[2] One common conclusion is well established: the median NBER/ASA forecasts tend to be about as accurate as comparable predictions from the best-known macroeconometric models. For example, McNees finds that the survey forecasts were better than the other early-quarter forecasters (Chase, DRI, Wharton) for the unemployment rate, the change in business inventories, and housing starts; furthermore, his measures show them to rank second on average for the other variables included. The summary error measures for the forecasts from these sources do not differ greatly.

New Initiatives

In September 1980, NBER mailed a letter to 258 persons known or believed to be regularly active in economic and business forecasting. The list included the current and past participants in the NBER/ASA surveys and additional names selected with the aid of membership lists of several professional organizations. All addressees were urged to join, rejoin, or continue to participate in the survey, as well as to suggest other qualified individuals. The second mailing, in February 1981—based on the resulting recommendations and also including those

who failed to respond to the first letter—went to 152 individuals. The purpose of these steps was to make the coverage of the survey not only larger (which was necessary because of a decline in the response rate during the late 1970s) but also more representative of the various industries and regions. Further, each letter invited the recipient to fill out an attached questionnaire seeking information about his or her: (1) reactions to the design and uses of the NBER/ASA survey; and (2) assumptions, methods, and techniques of forecasting. Completion of the special questionnaire, while much appreciated, was optional, not a condition for joining the survey. To help evaluate the results of the above initiatives and to decide on any desirable changes in the survey, an advisory committee was established, with the support of the ASA Business and Economic Statistics Section and its 1980 and 1981 chairmen, Arnold Zellner and George C. Tiao.

The reply rate was 42 percent to the first mailing and 34 percent to the second mailing. There were 76 individuals interested in responding to future surveys, including 44 prospective new members. Most of the positive replies came from well-known individuals and organizations— leading consulting firms and econometric modeling services, major nonfinancial corporations, banks and other financial intermediaries, and research and academic institutions. This augured well for the quality of the future surveys, even though no commitments to regular participation could reasonably be requested, and none were assumed.

There was much useful information in the 67 completed questionnaires and the many separate comments received in response to the two mailings. The results were tabulated and summarized for use in our deliberations on how to improve the NBER/ASA survey. There was little criticism of the existing coverage but strong sentiment in favor of expanding the survey by inclusion of several additional variables. The problem was how to revise the questionnaire without either losing essential continuity or overloading the survey and thus discouraging future participation.

The following are the main decisions made: (1) to include in the survey all major expenditure components of real GNP; (2) to add CPI inflation, 3-month Treasury bill rate, and new high-grade corporate bond yield; (3) to retain nominal GNP, the GNP implicit price deflator, corporate profits after taxes, unemployment rate, industrial production, and housing starts. The new questionnaire includes 17 instead of 11 variables. Also: (4) annual forecasts for the current and the next year are now regularly obtained in addition to the five quarterly ones; (5) the section on forecasters' assumptions has been revised to elicit more specific and informative replies; (6) technical improvements have been made in the questions on the probability distributions; and (7) some questions will be asked separately from time to time, namely those concerning forecasters' methods and their longer-run expectations of real growth and inflation.

We now have a year's worth of experience with the new format of the survey and find that it is working well. The response rate has picked up lately: 42 responded to

[1] See NBER, Explorations in Economic Research (through 1977) and NBER Reporter (since 1978). The ASA reports appeared first in the American Statistician and later (since 1974) in AmStat News. On the origin of the survey and the design of the questionnaire, see G. H. Moore, "Forecasting Short-Term Economic Change," Journal of the American Statistical Association, March 1969, and V. Zarnowitz, "The New ASA-NBER Survey of Forecasts by Economic Statisticians," American Statistician, February 1969.

[2] C. F. Christ, "Judging the Performance of Econometric Models of the U.S. Economy," International Economic Review, February 1975; R. C. Fair, "An Evaluation of a Short-Run Forecasting Model," ibid., June 1974; S. K. McNees, "The Forecasting Record for the 1970s," New England Economic Review, September/October 1979 (also, ibid., 1974, 1975, and 1976); G. H. Moore, op. cit.; V. Su and J. Su, "An Evaluation of the ASA/NBER Business Outlook Survey Forecasts," Explorations in Economic Research, Fall 1975; V. Zarnowitz, "How Accurate Have the Forecasts Been?" in W. F. Butler, R. A. Kavesh, and R. B. Platt, eds., Methods and Techniques of Business Forecasting, Englewood Cliffs, N.J.: Prentice-Hall, 1974, and "An Analysis of Annual and Multiperiod Quarterly Forecasts of Aggregate Income, Output, and the Price Level," Journal of Business, January 1979.

the 1982:2 survey, compared with fewer than 30 who responded to other recent surveys. The participants include active and very well-known members of the forecasting community. With its increased scope, the survey now generates much more information, while its time schedule and costs are about the same as before. Some of the newly added variables are particularly difficult to forecast, but they are of major interest and are being continually predicted in the business world anyway.

Work in Process

New studies of economic forecasts and expectations, now being conducted under a grant to the Bureau from the National Science Foundation (SES-7920361), use the full set of individual predictions from the NBER/ASA surveys along with other concurrent and earlier data from a variety of sources. Past research had to rely mainly on average measures from small samples of varying composition and uncertain consistency, leading to results exposed to possibly large aggregation errors and specification biases. Our current work is much less vulnerable in this respect and more informative generally, because a broader and cleaner data base has been constructed. The time series of predictions at our disposal are numerous and highly diversified in origin and method, but they are also well identified in terms of the sources, variables, dates of release, and target periods covered. Our collection includes detailed data from other business outlook surveys and some econometric (model) forecasts for the earlier years after World War II, although this information is much more limited than the comparatively rich data available since 1968.

A strong finding from a recent paper based principally on the NBER/ASA data is that the mean predictions from a series of surveys are, on the average over time, more accurate than most of the corresponding sets of individual forecasts.[3] However, there is also a moderate degree of consistency in the relative performances of the forecasters, about 20–33 percent of whom score well above the group means with respect to several variables and predictive horizons.

Inflation has been predominantly underestimated and real growth overestimated, increasingly so for the more distant target quarters, but by decreasing margins. The tests of the joint null hypothesis that the regressions of actual on predicted values have zero intercepts and unitary slope coefficients are very unfavorable to expectations of inflation, but generally they show the forecasts of other variables in much better light. The incidence of autocorrelation in the prediction errors was also much higher for inflation than for other variables (growth rates in real and nominal GNP and consumer durables, unemployment, and inventory investment).

[3]V. Zarnowitz, "Expectations and Forecasts from Business Cycle Surveys," NBER Working Paper No. 845, January 1982.

Nearly 60 percent of the regular survey participants rank first the "informal GNP model," an eclectic and judgmental approach to forecasting the economy by sectors, mainly on the expenditure side. (This means that this method was most important to these forecasters in terms of their own work.) Leading indicators and anticipations data are used widely but seldom given first rank. Even those who have their own econometric models report using such other information complementally, and the same is true of those who rely primarily on "outside" models from econometric service bureaus. The latter have achieved an above-average record in the 1970s, but on the whole the differences in accuracy between groups classified according to the reported methods are small. They are much less important than the differences resulting from the characteristics of the variables and periods covered.

Other studies are progressing that should contribute to our (still very deficient) understanding of the predictive process. They describe, and attempt to explain, the behavior over time of cross-sectional data from successive surveys; the distributions of the reported subjective probabilities the respondents attach to alternative forecasts; and the effects on the forecasts of past errors and data revisions. In this last context, adaptive and other time-series models will be used as estimated from the same data that were available to the participants at the time of each survey. To this end, all revisions of the relevant series have been recorded and stored in machine-readable form.

Second Quarter 1982

Victor Zarnowitz

According to the median forecast from the May survey of professional economic forecasters taken by NBER and the American Statistical Association, (the responses to which numbered 42), the contraction in real GNP will come to a halt in 1982:2, to be followed by a very gradual recovery in the year ahead. The recovery will reflect mainly an increase in real expenditures by households; business investment will remain very weak. Although the expansion will proceed at rates that are low by historical standards, it is not expected to falter during 1983. No renewal of strong inflationary pressures is anticipated. Interest rates will decline, but slowly, staying atypically high in real terms.

Once more, the declines in both inflation and total output during the preceding quarter had been somewhat underestimated, and forecasters on the average revised their near-term predictions downward.

Hesitant Transition to a Slow Recovery

Forecasters estimate the chances as 56 in 100 that output will decline in the current quarter, according to the probability distributions reported by each of the survey participants. For the next four quarters, through 1983:2,

the corresponding mean probabilities are 27, 16, 20, and 23 percent. The median of the individual forecasts indicates a very slight decline of real GNP in 1982:2 (three months ago, a small increase was expected). For 1982:3–1983:2, the group predictions of the annual rates of growth in the four successive quarters are 3.4, 4.1, 2.5, and 3.3 percent, so no tendency either to flag or to accelerate is envisaged. The most likely estimate for the period as a whole is 3.3 percent, much less than the average gain recorded during the first year of the previous post–World War II expansions (7.5 percent).

Despite the resumption of growth in the second half of the year, output in 1982 as a whole will be less than in 1981, according to a large majority of forecasters. The mean probability of this outcome is as high as 82 percent, although the expected declines are small (averaging just over 1 percent). In 1983 real GNP is to rise 3 percent over 1982. Combined with the quarterly predictions through 1983:2, this implies that the expansion will continue at about the same average annual rate in the second half of 1983. But the variance of the individual predictions for 1983 is relatively large. The average probabilities of negative, low (less than 4 percent), and higher growth are 13, 61, and 26 percent, respectively.

Moderate Inflation

The GNP implicit price deflator will increase at annual rates varying narrowly between 6.1 percent and 6.4 percent in each of the four quarters through 1983:2. The corresponding figures for the consumer price index, again according to the median predictions, are 5.8 percent–6.3 percent. The expectations regarding inflation in 1981–82 and 1982–83 are 6.4 percent and 6.3 percent in terms of IPD, 5.7 percent and 6.1 percent in terms of CPI. Thus all these group forecasts cluster rather closely around 6 percent. The distributions of the mean probabilities attached to the different possible percentage changes in IPD show concentrations in the range of 6 percent–7.9 percent for both 1981–82 and 1982–83 (55 and 48 percent, respectively) and are strongly skewed toward lower inflation rates (39 and 42 percent). These forecasts suggest that a major reduction in inflation will indeed have been achieved. (Recall that, as recently as in 1981, IPD increased 9.2 percent and CPI 10.4 percent.)

Gradual Declines in Interest Rates

Despite the lower inflation, no major drops in interest rate are anticipated by the majority of forecasters. The 3-month Treasury bill rate is predicted to average 12.3 percent in 1982:2 and the same for 1982 as a whole (it was 12.9 percent in 1982:1). The median forecasts for the four quarters through 1983:2 are 11.8, 12.0, 12.2, and 11.5 percent. The average for 1983 is 11.8 percent. Some foresee a shallow U pattern (small declines followed by small rises), but very few predict that the rates will show a net increase over the entire period covered. The yield on new issues of high-grade corporate bonds, estimated at 15.2 percent in 1982:2 (down from 16.1 percent in 1982:1), is expected to stay close to 14.5 percent in the second half of this year, decline to 14 percent by mid-1983, and average 13.8 percent for 1983 as a whole. Thus consider-

ably larger reductions are expected in the long- than in the short-term rates. Yet the prevailing view is pessimistic in that the predicted nominal rates fail to show declines commensurate to those in inflation, so that the implied real interest rates remain at historically high levels (of about 6 to 8 percent) even a year or 18 months from now.

Unemployment, Production, and Profits

All but a few forecasters see unemployment as continuing to exceed 9 percent of the civilian labor force through the rest of this year (the averages are 9.4 percent in the summer and 9.2 percent in the fall). In 1983, the jobless rate is expected to decline slowly according to most predictions: the median figures are 9 percent and 8.9 percent for the first two quarters, 8.8 percent for the year as a whole.

The index of industrial production (for manufacturing, mining, and public utilities) is to decline 5.3 percent in 1982, then gain 6.3 percent in 1983. The average predicted rise of this index between 1982:2 and 1983:2 is 6.7 percent. After the huge inventory liquidation in the first half of 1982, a modest buildup of the stocks in the year ahead is expected to accompany a revival of consumer spending and factory output.

Corporate profits after taxes will rise from $120 billion to $144 billion during the year ending in 1983:2, according to the composite (median) forecast from the survey. This is a gain of 20 percent, perhaps 2/3 of it in real terms, but from a very depressed level. The decline in 1981–82 is calculated conservatively at 18 percent; the average prediction for 1982–83 is an increase of 15 percent.

Business Investment Stagnant through 1983

The composite forecast has nonresidential fixed investment at a low plateau of between $156 and $158 billion (1972 dollars, annual rate) from 1982:2 through 1983:2. The annual figures are $162, $158, and $159 billion for 1981, 1982, and 1983, respectively. The figures refer to gross investment, masking the greater weakness of net business capital formation. The presumed reasons for the pessimism lie in the anticipated persistence of high real interest rates, low capacity utilization, and low corporate profits. Another adverse factor is the weakness of exports associated with the strength of the dollar. Net exports of goods and services are seen as "stuck" near the level of $37 billion (1972 dollars, annual rate) for the next year.

A Consumer-Led Upturn

Total consumption expenditure in constant dollars is expected to show rates of growth very similar to those of real GNP, ranging from 2 percent to 4.6 percent in the quarters between 1982:2 and 1983:2, and averaging 3.3 percent. The highest growth in both output and consumption is to occur in 1982:4, following the stimulus of the 10 percent midyear tax cut. The annual gains in consumption are predicted to average 1.6 percent in 1982 and 3.1 percent in 1983.

New private housing starts will increase from 1 million units in 1982:2 to 1.3 million units in 1983:2 (annual rates).

Projections of GNP and Other Economic Indicators, 1982-83

		Annual			
				Percent Change	
	1981 Actual	1982 Forecast	1983 Forecast	1981 to 1982	1982 to 1983
1. Gross National Product ($ billions)	2925.5	3075.5	3364.0	5.1	9.4
2. GNP Implicit Price Deflator (1972 = 100)	193.7	206.1	219.0	6.4	6.3
3. GNP in Constant Dollars (billions of 1972 dollars)	1510.3	1494.0	1538.2	-1.1	3.0
4. Unemployment Rate (percent)	7.6	9.2	8.8	1.6[1]	-0.4[1]
5. Corporate Profits After Taxes ($ billions)	155.5	127.0	146.0	-18.3	15.0
6. Nonresidential Fixed Investment (billions of 1972 dollars)	162.4	158.0	159.0	-2.7	0.6
7. New Private Housing Units Started (annual rate million)	1.1	1.0	1.3	-9.1	30.0
8. Change in Business Inventories (billions of 1972 dollars)	7.1	-5.4	5.3	-12.5[2]	10.7[2]
9. Treasury Bill Rate (3-month, percent)	14.1	12.3	11.8	-1.8[1]	-0.5[1]
10. Consumer Price Index (annual rate)	10.4	5.7	6.1	-4.7[1]	0.4[1]

			Quarterly					
			1982		1983		Percent Change	
	1982 Q1 Actual	Q2	Q3	Q4	Q1	Q2	Q1 82 to Q1 83	Q2 82 to Q2 83
				Forecast				
1. Gross National Product ($ billions)	2995.1	3030.0	3100.5	3180.5	3251.0	3330.0	8.5	9.9
2. GNP Implicit Price Deflator (1972 = 100)	201.9	204.4	207.5	210.7	214.0	217.2	6.0	6.3
3. GNP in Constant Dollars (billions of 1972 dollars)	1483.6	1483.5	1496.0	1511.0	1520.5	1533.0	2.5	3.3
4. Unemployment Rate (percent)	8.8	9.4	9.4	9.2	9.0	8.9	0.2[1]	-0.5[1]
5. Corporate Profits After Taxes ($ billions)	118.8	119.5	130.0	138.5	138.0	143.5	16.2	20.1
6. Nonresidential Fixed Investment (billions of 1972 dollars)	162.4	158.0	157.0	156.5	156.5	157.5	-3.6	-0.3
7. New Private Housing Units Started (annual rate million)	0.9	1.0	1.1	1.2	1.2	1.3	33.3	30.0
8. Change in Business Inventories (billions of 1972 dollars)	-17.5	-8.0	0.0	2.9	3.6	5.1	21.1[2]	13.1[2]
9. Treasury Bill Rate (3-month, percent)	12.9	12.3	11.8	12.0	12.2	11.5	-0.7[1]	-0.8[1]
10. Consumer Price Index (annual rate)	3.3	3.4	5.8	6.0	6.3	6.1	3.0[1]	2.7[1]

SOURCE: National Bureau of Economic Research and American Statistical Association, Business Outlook Survey, June 1982. The figures on each line are medians of thirty-two to forty-two individual forecasts.

[1] Change in rate, in percentage points.
[2] Change in billions of dollars.

The annual forecasts are also 1 and 1.3 million units for 1982 and 1983, respectively. The group median predicts that nonresidential fixed investment will rise 20.5 percent in the year ending in mid-1983 and 18.5 percent in 1982-83. Yet its level in 1983 would not be much higher than that recorded in 1981 (the forecast is $47.4 billion, the 1981 figure $45.2 billion, both in 1972 dollars).

Government Actions and Policies

State and local government purchases will change very little in the near future. The group average forecast for 1982 is $177 billion (1972 dollars), that for 1983 is $176 billion (the 1981 figure is $180 billion). Despite the expected buildup of defense outlays, which forecasters on the average assume will amount to about 7 percent (with a range of 4-10 percent), the rise in total federal government purchases is seen as tapering off in the near future, from 4.9 percent in 1982 to 0.9 percent in 1983, when the level of these purchases in real terms will be $118 billion.

Twenty-two forecasters state that they assumed the implementation of the recently enacted tax legislation, but 13 foresee "additional taxes in 1983." The assumptions about monetary policy vary; for example, 20 forecasters set M1 growth at 4-6 percent, 10 at 7-8 percent. Many respondents expect energy demand and prices to be stable or declining. The views on the trade outlook are divided, with some forecasters assuming that the dollar will weaken, others—somewhat more numerous—that it will not.

This report summarizes a quarterly survey of predictions by about fifty 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 Gregory Tang of NBER, was responsible for tabulating and evaluating this survey.
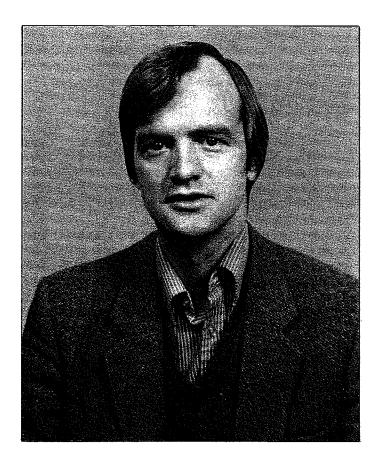
NBER Profiles

Willem H. Buiter

Willem H. Buiter has been a member of NBER's Program in International Studies since 1979. A native of the Netherlands, Buiter received his B.A. from Cambridge University (England) in 1971 and his Ph.D. from Yale University in 1975.

Between 1975 and 1979, Buiter was assistant professor of economics and international affairs in the economics department and the Woodrow Wilson School at Princeton University. In 1976–77, Buiter lectured in economics at the London School of Economics and Political Science, where he is now a professor of economics. From January 1980 to April 1982, Buiter was professor of economics at the University of Bristol (England).

In addition to his teaching, Buiter has served as an adviser to the House of Commons Select Committee on the Treasury and Civil Service and as associate editor of the *Economic Journal* and the *Journal of Economics Dynamics and Control*. His work has also been widely published in economic journals; his fields of interest are macroeconomics, international finance, and monetary theory.

Albert T. Sommers

The newest member of NBER's Board of Directors, appointed in April, is Albert T. Sommers. Sommers is senior vice president and chief economist of The Conference Board.

A graduate of Columbia University with an M.A. from New York University, Sommers joined The Conference Board in 1950 as senior economist. In 1971, he became director of economic research and in 1965, vice president. He was promoted to his current position with The Conference Board in 1972.

A Fellow of the National Association of Business Economists and past winner of the Butler Prize of the New York Association of Business Economists, Sommers served on the Economic Advisory Board of the Department of Commerce from 1971–73 and was chairman of the Price Advisory Committee of the Council on Wage and Price Stability from 1979–80. He has also been a lecturer in economics at Columbia University.

In his leisure time, Sommers plays tennis and chess. He and his wife, Jean, have a son, John, and a daughter, Elizabeth.

Conferences

U.S. International Trade Policy

Members of NBER's Program in International Studies and of the Washington policy community met at the Library of Congress on March 4 and 5 to discuss U.S. international trade policy. The conference, organized jointly by the NBER and Congressional Research Service, involved a discussion of NBER research results, an exchange of information and ideas about current trade policy, and participants' suggestions of topics for future research. The formal agenda was:

William H. Branson, Princeton University and NBER, "OPEC Lending, LDC Growth, and U.S. Trade"

Discussant: William Niskanen, Council of Economic Advisers

Gene M. Grossman, Princeton University and NBER, and J. David Richardson, University of Wisconsin and NBER, "Current Issues and Options for U.S. Trade Policy: A Research Perspective"

Discussant: Gordon L. Streeb, U.S. Department of State

C. Michael Hathaway, Office of U.S. Trade Representative, "The Impending Crisis in U.S. Trade Policy"

Anne O. Kreuger, University of Minnesota and NBER, "Trade Policy Research: Some Remarks"

Discussant: Alfred Reifman, Congressional Research Service

Paul R. Krugman, MIT and NBER, "Technology Gaps, Technology Transfers, and the Changing Character of U.S. Trade"

Discussant: William R. Cline, Institute for International Economics

Laurence J. Kotlikoff, Council of Economic Advisers, Yale University and NBER, "The International Economics of Transitional Growth: The Case of the United States"

Discussant: Lloyd C. Atkinson, Congressional Budget Office

Panel Discussion:
Topic: "Issues and Options for U.S. Trade Policy" Lee Price, United Auto Workers; Helen B. Junz, Townsend, Greenspan & Co; Anne O. Krueger; Robert Russell, Committee on Foreign Relations, U.S. Senate

Branson's paper discusses the connection from the OPEC surplus to LDC borrowing and growth, and the consequences for U.S. trade. He argues that LDC growth provides a substantial market for the export of U.S. capital goods. The discussion of his paper centered on the question of the effect of a future diminution of the OPEC surplus.

The Grossman–Richardson paper, which has appeared subsequently as an NBER Research Report, focuses on the shift of international research to consideration of processes rather than isolated events. Trade policy, in particular, was discussed as a process that reacts to continuing changes in trade pressure.

Hathaway's work focuses on the current trade situation and negotiations. Krueger's paper introduces a discussion of trade policy research with a description of the background for the NBER's new project on American Trade Relations.

The Krugman paper expands on the idea of countries and commodities both moving up a technology "ladder," with the countries at the top feeling a squeeze. The discussion that followed focused on the possibilities of new technologies actually extending the ladder.

The main point of Kotlikoff's paper, jointly written with Jeffrey Sachs and Edward Leamer, is the transition of the United States from the dominant economy after World War II back to one of several major economic competitors by 1980.

Throughout the conference, there was a lively debate on the meaning and virtues of the new concept of bilateral reciprocity. Another problem that emerged from the discussions is the difficulty of an essentially free trade policy in a world of, at best, conditional free trade.

The continuing NBER research by this group, including a conference on trade relations organized by Anne Krueger, will be detailed in future issues of the NBER Reporter.

A Retrospective on the Classical Gold Standard, 1821–1931

Fifty-four economists and economic historians gathered at Hilton Head Island (South Carolina) the evening of March 18 for a three-day conference sponsored by the NBER on "A Retrospective on the Classical Gold Standard, 1821–1931." The objective of the conference was to reexamine unsettled issues with respect to the operation of the gold standard during the 110 years preceding 1931, when convertibility of the British pound ended.

The subject of an introductory session on the first day, chaired by NBER Director-at-Large Moses Abramovitz of Stanford University, was the gold standard as interpreted in traditional and revisionist works. The following papers were discussed:

Michael D. Bordo, University of South Carolina, "How the Gold Standard Worked: The Traditional Approach"

Discussant: C. Knick Harley, University of Western Ontario

Donald McCloskey, University of Iowa, and J. Richard Zecher, Chase Manhattan Bank, "The Success of Purchasing Power Parity: Historical Evidence and Its Implications for Macroeconomics"

Discussant: Robert E. Lipsey, Queens College and NBER

Paul Gregory, University of Houston, Badi Baltagi, and Joel Sailors, "How the Gold Standard Worked, 1880–1914: Intercountry and Intertemporal Evidence"
Discussant: Brinley Thomas, University of California, Berkeley
Milton Friedman was a general discussant during the session.

Bordo's paper surveys six major themes of the traditional approach to the gold standard since the eighteenth century: (1) gold as an ideal domestic and international standard; (2) the price–specie flow mechanism; (3) the law of one price; (4) short- and long-term capital flows in the adjustment mechanism; (5) the role of central banks; and (6) schemes for reform of the gold standard. He documents the views of five schools of thought: classical, neoclassical, Harvard neoclassical, interwar critics, and post–World War II reinterpreters, concluding that each reflected the policy concerns of the time. He regards the evolution of the interpretation of the gold standard as characteristic of a scientific revolution.

McCloskey and Zecher's paper is a sequel to their 1976 publication that presented historical evidence in support of their view that the balance of payments is a reflection solely of excess demand or supply in the money market. The conference paper takes issue with the traditional view that, under the gold standard, prices in one country could be out of line with prices in the rest of the world for considerable periods of time, inducing first a gold flow, then a change in that country's money supply, then adjustment in its price level to bring it into line with other countries. In their view, prices never diverge internationally (except for trade impediments, transportation, and transactions costs), because rational economic behavior of consumers and producers links prices through arbitrage.

Gregory, Baltagi, and Sailors offer an econometric test of the operation of the gold standard, using a combined time-series cross-section of historical data for seven countries (France, Germany, Japan, Russia, Sweden, the United States, and the United Kingdom). The authors present a three-equation model for the balance of payments on current account, the money supply, and the price level, expressed as annual rates of growth. They believe their results refute the McCloskey–Zecher argument because of significant lags found in the movements of prices and interest rates among the countries in their sample.

In the second session, chaired by Robert Mundell of Columbia University, three papers dealt with the operating procedures of the Bank of England in its pre–World War I role as arbiter and enforcer of the so-called "rules of the game":

John C. Dutton, Jr., North Carolina State University, "The Bank of England and 'The Rules of the Game' under the International Gold Standard: Some Additional Evidence"
Discussant: Donald E. Moggridge, University of Toronto
John E. Pippenger, University of California, Santa Barbara, "Bank of England Operations, 1893–1913:

Adjustments of the Reserve Ratio and of Bank Rate"
Discussant: Charles A. E. Goodhart, Bank of England
Rudiger Dornbusch, MIT and NBER, and Jacob A. Frenkel, University of Chicago and NBER, "The Gold Standard and the Bank of England in the Crisis of 1847"
Discussant: J. R. T. Hughes

Dutton's paper examines the record of the Bank of England in observing the rules of the game from the late 1880s until 1914. One version of the rules requires central banks to reinforce or not counteract the effects of gold flows on domestic money supplies. An alternative version is that central banks should refrain from countercyclical operations, limiting their objective to maintenance of convertibility. Dutton tests adherence to the two versions with a monthly linear feedback model, using the residuals of an ARIMA model of policy tools (Bank rate and changes in the Bank's portfolio of interest-bearing assets) as functions of three target variables: the Bank's reserves, or the proportion of reserves to liabilities, or gold flows; domestic activity proxied by a railway receipts variable, or unemployment data; and the inflation rate. He finds weak evidence that the Bank engaged in countercyclical activity and that one-half to two-thirds of gold inflows or reserve increases were offset by changes in the Bank's security holdings. He concludes that the Bank may have violated both versions of the rules.

Pippenger's paper, in contrast, finds that the Bank did play by the rules. He distinguishes between long-run behavior and short-run behavior. For the former, he relies on annual averages of monthly data; for the latter, on monthly changes. He estimates three equations for the Bank's desired reserves, the proportion, and Bank rate. Regressors in the long-run equations include its non-bank deposits, bankers' balances, the domestic interest rate on fortnightly loans, the French market interest rate relative to the U.K. rate, and the railway freight receipts proxy for domestic activity. For each equation, the results suggest the Bank's sensitivity to the threat to convertibility posed by international capital flows or by increases in domestic incomes. Pippenger finds evidence suggesting the Bank's concern for its profits but no evidence suggesting that it accommodated changes in the level of domestic activity. Regressors in the short-run equations, in addition to those referred to for the long-run equations, include a stock adjustment term, change in gold flows, and seasonal dummies. Pippenger finds no evidence of a stock adjustment mechanism. Month-to-month changes in reserves and the proportion appear to be dominated by seasonal factors and external gold flows.

Dornbusch and Frenkel examine the operation of the gold standard and the performance of the Bank of England during 1847, a year when it was faced with extraordinary payments abroad for agricultural imports against a background of domestic demand for capital for railroad expansion. The Bank procrastinated until its bullion fell to a low point in April. Then it curtailed discounts and domestic business failures mounted. However, international capital inflows ensued, and a reflow of bullion to

the Bank restored confidence. A new crisis in October resulted from an internal drain of bullion reinforcing an external drain. Confidence was restored by suspension of Peel's Act limiting the Bank's fiduciary issue, coupled with a high discount rate that attracted capital and bullion from abroad. Dornbusch and Frenkel conclude that, until the principle, "during crises discount freely," was firmly established, the gold standard provided an extremely poor standard for financial markets.

The third session, chaired by Karl Brunner, University of Rochester, was devoted to the gold standard experience of four countries other than Great Britain and the United States:

Ronald Shearer, University of British Columbia, and Carolyn Clark, Washington State University, "Canada and the Gold Standard, 1920-1931: Monetary Policy without a Central Bank"

Discussant: Charles Freedman, Bank of Canada and NBER

Paul McGouldrick, State University of New York, Binghamton, "Operation of the Reichsbank under the Gold Standard, 1870-1914"

Discussant: Heywood Fleisig, The World Bank

Lars Jonung, University of Lund, "Swedish Experience under the Gold Standard, 1860-1931"

Discussant: Peter H. Lindert, University of California, Davis

Michele Fratianni, Council of Economic Advisers, and Franco Spinelli "Italian Experience under the Gold Standard, 1860-1914"

Discussant: Richard E. Sylla, North Carolina State University

Shearer and Clark address two questions: How did Canada, without a central bank, achieve the money supply appropriate to the return to gold by mid-1924? Having reestablished the gold standard so easily, why did it suspend the standard so quickly in early 1929? They conclude that there was no conscious design to restore the gold standard. Resumption was an accidental by-product of retirement of the British World War I floating debt in Canada, and the deflationary effect of an unchanging level of rates on government advances to the banks when market rates fell below those rates. The authors' answer to the second question is that the rates on advances were so out of line with the call loan rates in the New York money market in 1929 that the Canadian foreign-exchange market came under severe stress. A gold drain that began in mid-1928 and was renewed in 1929 led to the use of gold devices in Canada to deter gold exports and eventually to an embargo.

McGouldrick's paper examines monthly and quarterly averages of weekly balance sheet items to determine how reserves, the portfolio, and monetary liabilities of the Reichsbank changed over German business cycles from 1879 through 1913. He finds that Reichsbank holdings of bills moved positively with domestic economic activity; its lending rates fell relative to market rates as domestic activity expanded; bank and nonbank holdings of high-powered money moved inversely, but gold holdings outside the Reichsbank moved positively, with do-

mestic economic activity. In addition, gold flows into and out of Germany, 1892-1907, were stable over full business cycles, suggesting that cyclically caused imbalances in German international trade and payments were settled by capital movements, not by gold flows. The author concludes that the stable behavior of macroeconomic aggregates before World War I indicates that the Reichsbank attempted to stabilize high-powered money over business cycles and prevented systematic gold inflows of an inflationary nature by an ostensibly procyclical but actually price-stabilizing policy.

Jonung's paper describes the pre–World War I evolution of the Swedish gold standard over a smoothly functioning, managed, paper currency monetary system. Gold hardly circulated at all domestically. It gravitated toward the Riksbank from within and without the country, providing a growing metallic reserve. Public trust of paper currency and low reserve requirements left the Riksbank and commercial banks with redundant gold and foreign-exchange reserves. Coincident with its adoption of the gold standard in 1873, Sweden experienced unusual monetary and political stability, and its real output grew at the fastest rate in Europe. Jonung concludes that, under the gold standard, international capital flows into Sweden served as an engine of growth.

Italian experience in the gold standard period, according to Fratianni and Spinelli, cannot be regarded as favorable to a commodity standard. A de facto gold standard existed only in 1861-68 and a de facto silver standard only in 1884-94. Convertibility was suspended 1866-84 and 1894-1913, but since Italian banks were still required to maintain a fractional specie cover for their notes issues, especially in the 1900s, fiscal and monetary policies achieved stable nominal magnitudes. The authors conclude that fiscal and monetary prudence sufficed to provide stability whether Italy did or did not adhere to the gold standard. They report that the exchange rate of the lira vis-à-vis the French franc floated more often than not but returned within the gold points during the 1900s when the lira was incontrovertible. Deviations from purchasing power parity were sizable and long lasting, attributed by them to the existence of country risk for foreign investors holding Italian debt instruments. The risk disappeared when Italy pursued prudent fiscal and monetary policies.

Three papers, presented at the fourth session, chaired by Allan H. Meltzer, University of Rochester, were concerned with international linkages under the gold standard:

Wallace Huffman, Iowa State University, and James R. Lothian, Citibank, "U.S.-U.K. Business-Cycle Linkages under the Gold Standard, 1834-1933"

Discussant: Michael B. Connolly, University of South Carolina

Stephen Easton, Simon Fraser University, "Real Output and the Gold Standard Years, 1830-1913"

Discussant: Geoffrey E. Wood, City University, London

George Rich, Schweizerische National Bank, "Canada without a Central Bank: Operation of the Price-Specie Flow Mechanism, 1872-1913"

Discussant: Peter Temin, MIT

The Huffman–Lothian paper examines two bodies of evidence on real-income interdependence under the gold standard. The first is a narrative account of major cyclical contractions in the United States and United Kingdom over the 100 years covered. The second is econometric, based on Granger–Sims autoregressive tests of causality for the combined period 1837–59, 1882–1914. The historical analysis leads to the conclusion that cyclical fluctuations under the gold standard were transmitted from one country to another by the monetary system. In some cycles, gold movements were the direct channel; in others, panic-induced changes in the money multiplier, often the indirect result of gold outflows and increases in interest rates, were the dominant channel. The authors regard the Granger–Sims tests as confirming a clear association in each country between movements in real income and past movements in money variables, and between interest rates in both countries. They conclude that real income in both countries was influenced by both domestic and other-country variables.

Easton's paper uses data for eight countries for 1879–1914 to search for evidence of correlation, or Granger–Sims causal influences, or both, between real or nominal income movements in the sample. He also searches for evidence that the relationship for 1830–79 might have differed from that of the later period, when the United States returned to the gold standard. For both periods, he finds little evidence that either real or nominal income was causally related in a bivariate fashion among countries. He then offers evidence on real output–inflation trade-offs, using the model and methodology devised by Robert Lucas. He finds some confirmation of the natural-rate hypothesis before 1879 but little thereafter. There is no confirmation of the prediction of the theory that as the variance of nominal income increases, demand shocks have little effect on real output, being increasingly absorbed as price level changes. Easton's explanation is that there is relatively little variability in the variance of nominal income across the countries in the sample: hence his inability to confirm the hypothesis.

George Rich's paper, the final one on the second day of the conference, reexamines Canadian evidence on the operation of the price–specie flow mechanism that was earlier studied by Jacob Viner. Rich analyzes the link between the Canadian balance-of-payments surplus and the Canadian money stock, using unpublished or hitherto unused data for the major Canadian banks. In the long run, he finds that the money stock was determined chiefly by the balance of payments, as suggested by the classical doctrine. In the short run, however, the price–specie flow mechanism did not work well, inasmuch as the money stock was negatively correlated with the balance-of-payments surplus. Although the gold standard constrained the ability of the chartered banks to create money, it did not prevent procyclical movements in the money stock, so that balance-of-payments deficits during business expansions did not effectively curb growth of the money stock. He regards the failure of the mechanism in the short run to be an important cause of cyclical instability under the gold standard.

The second day of the conference concluded with a dinner at which Leland Yeager, University of Virginia, gave a talk entitled "The Image of the Gold Standard." Citing views that were expressed in Austria–Hungary and Russia at the close of the nineteenth century, when these countries were considering adopting the gold standard, he noted that poor performance of the fiat paper currency was not one of the reasons offered by the advocates. Instead, they appealed to the prestige among nations that adherence to a gold standard conferred. Yeager concluded that, in present circumstances, without a return to nineteenth-century attitudes favoring limitations on the scope of government activity and restraint on seeking special advantage through government, a restored gold standard would not work well and would hardly endure.

Two papers were presented on the final morning of the conference, with Richard Timberlake, University of Georgia, serving as the chairman:

Daniel Benjamin and Levis Kochin, University of Washington, "War Prices and Interest Rates: Gibson's Paradox Revisited"

Discussant: Phillip Cagan, Columbia University and NBER

Hugh Rockoff, Rutgers University, "Some Evidence on the Real Price of Gold, Its Cost of Production, and Commodity Prices"

Discussant: Robert J. Barro, University of Rochester and NBER

Benjamin and Kochin report that during the more than two centuries of British adherence to gold, there is no evidence of persistent trends in either the price level or the yield on consols. Both series are essentially random walks. The authors attribute the appearance of a comovement to a spurious regression in the eye of the beholder, rather than a significant relation in the data. Once the influence of war is taken into account, they argue, there is little evidence of a linkage between the price level and the long-term interest rate. They conclude that there is no evidence of persistent inflation or deflation during the gold standard years and hence there can be no positive association between current interest rates and past inflation, as Irving Fisher posited. They dismiss Fisher's finding that a distributed lag on past inflation rates is positively correlated with current interest rates, since such a method of forecasting would be rational only if inflation rates are positively serially correlated. The authors report that they are not.

Rockoff's paper analyzes the reaction of gold production to movements in the relative price of gold. Since gold's nominal price was fixed during most of the period before 1933, the issue is the response of gold output to variations in the general price level. Rockoff discusses gold discoveries, advances in mining techniques, the willingness of producers to adopt existing capital-intensive methods of production, and government imposition or relaxation of regulations affecting mining. He also compares the performance of the gold standard with that of the post-World War II U.S. monetary system by

examining means and standard deviations of annual growth rates of the world's monetary gold stock from 1807 to 1829 and of the U.S. monetary base from 1949 to 1979. Growth rates were slower and standard deviations of the growth rates were lower under the gold standard than in the modern period. However, he doubts that the stability and elasticity of the gold supply in the nineteenth century can be extrapolated to the present time. The core of dedicated prospectors working in largely unexplored areas does not now exist. The absence of political interference that prevailed does not seem likely nowadays, and the long and uncertain lags that marked the supply response hardly seem acceptable in an impatient age.

The conference was organized by Anna J. Schwartz of NBER. Also attending were: Barry Eichengreen, Harvard University and NBER; Stanley L. Engerman, University of Rochester and NBER; Martin M. G. Fase, De Nederlandsche Bank (Amsterdam); Milton Friedman, The Hoover Institution; Roy W. Jastram, University of California, Berkeley; Robert Keleher, Federal Reserve Bank, Atlanta; Leslie Lenkowsky, Smith–Richardson Foundation; Robert N. McCauley, Federal Reserve Bank of New York; Robert Weintraub, Joint Economic Committee; and Lawrence White, New York University.

The papers presented at the conference will be published as a conference volume, and a summary report of the conference will be available later this year. Information on these publications and on the availability of the papers in the Bureau's Working Papers series will appear in future issues of the NBER Reporter.

Financial Aspects of the U.S. Pension System

NBER's Project on Public and Private Pensions held a conference on financial aspects of the U.S. pension system at Amelia Island Plantation, Florida, on March 25 and 26, 1982. This was the first in a series of three planned conferences, each focusing on a different aspect of the U.S. pension system. Twelve papers were presented and discussed during the two-day conference.

In their paper, "The Economic Status of the Elderly," (NBER Working Paper No. 914), Michael D. Hurd and John B. Shoven, of Stanford University and NBER, present a picture of the economic status of the elderly population in the United States that contrasts sharply with some popularly held views. All of their calculations indicate that, on average, the elderly did relatively well economically over the decade of the 1970s and that they were not particularly vulnerable to inflation. The aggregate data show that incomes of the elderly increased faster than incomes of the rest of the population even though the labor force participation of the elderly declined. A substantial part of the elderly population was protected from inflation and those who were highly vulnerable to it were mostly wealthy and thus better able to tolerate the inflation risk.

Several papers dealt with the nature and economic function of private pensions. Edward P. Lazear, University of Chicago and NBER, in "Pensions as Severance Pay" (NBER Working Paper No. 854), presents a model in which defined-benefit pension plans serve as a form of severance pay designed to ensure efficient labor mobility. Using data from the 1980 Bankers Trust Corporate Pension Plans Study, he finds that most firms appear willing to offer pension benefits with a higher present value to workers who retire early. He interprets this finding to imply that in the later years of life wages exceed the marginal productivity of labor so that firms have an incentive to encourage workers to take early retirement.

In their paper, "Who Owns the Defined-Benefit Pension Plan?" (NBER Working Paper No. 924), Jeremy I. Bulow, Stanford University and NBER, and Myron S. Scholes, University of Chicago and NBER, challenge some widely accepted ideas about such plans. In the last several years, many financial economists have viewed assets held in trust by defined-benefit pension plans of large corporations as corporate assets; the obligation to pay employees during retirement is thus a corporate liability, similar to secured debt. Any difference between the value of the assets and the value of the liability is therefore a part of shareholders' equity. Bulow and Scholes, however, feel that this is an overly simplistic view and that in reality the employees and the stockholders share ownership of the pension fund. The equity stake of the employees stems from firm-specific human capital, which allows them to capture some of the monopoly rents of the corporation, and from the provisions of the Employee Retirement Income Security Act of 1974 (ERISA).

The effects of ERISA are also the subject of another paper, "Economic Implications of ERISA" (NBER Working Paper No. 927), by Bulow, Scholes, and Peter Menell, Stanford University. ERISA changed the ownership rights to defined-benefit plans through the establishment of minimum vesting and benefit accrual standards, the establishment of the benefit insurance program, and through the definition of fiduciary responsibility of plan administrators. The authors argue that, despite these changes, the increase in nominal interest rates since 1974 has significantly reduced the impact of ERISA by drastically reducing the present value of vested benefits.

"Pension Funding Decisions, Interest Rate Assumptions, and Share Prices," by Martin Feldstein and Randall Morck, Harvard University and NBER, attempts to assess the extent to which the market value of firms accurately reflects their unfunded pension obligations. Using a new body of data on 132 firms, the authors show that the market sets values that are related more closely to a pension obligation evaluated at a common standard interest rate than to the pension obligations as reported by the firms. This common interest rate, however, appears to be much lower than the long-term market interest rate prevailing at the time the sample was taken.

In his paper, "Pension Funding, Pension Asset Allocation, and Corporate Finance: Evidence from Individual Company Data," Benjamin M. Friedman, Harvard University and NBER, looks for systematic relationships between the composition of a corporation's balance sheet

and the management of its pension fund. Using a merged data set on individual companies assembled from Standard & Poor's Compustat files and from the U.S. Department of Labor's Form 5500 files, he finds evidence that corporations time their pension contributions so as to smooth their reported earnings.

"Optimal Funding and Asset Allocation Rules for Defined-Benefit Pension Plans," by J. Michael Harrison and William F. Sharpe of Stanford University and NBER develops a theoretical model that leads them to conclude that the current tax and insurance policies of the U.S. government regarding pensions make it optimal for firms to follow extreme funding and investment strategies. The authors show that, given the trade-off between the insurance and tax effects, a firm would generally be expected to follow a strategy of either: (1) full funding plus investment solely in bonds; (2) minimum funding plus investment solely in stocks; or (3) full funding and investment solely in stocks.

In his paper, "Investing for the Short and the Long Term" (NBER Working Paper No. 922), Stanley Fischer, Hoover Institution and NBER, considers how the length of an investor's portfolio holding period influences his optimal asset allocation between stocks and bills. He finds that optimal portfolios change little as the holding period changes and that, for "typical" utility functions, these optimal portfolios are very heavily in stocks.

In their paper, "Retirement Annuity Design in an Inflationary Climate" (NBER Working Paper No. 896), Zvi Bodie, Boston University and NBER, and James E. Pesando, University of Toronto and NBER, examine the tilt and risk-return characteristics of real retirement incomes provided by variable annuities tied to bills, bonds, and stocks and contrast them with conventional nominal annuities. They also consider several innovations in annuity design, which have appeared in recent years in response to increased inflation uncertainty, and show them to be variants of the standard variable annuity.

"Observations on the Indexation of Old Age Pensions," by Lawrence H. Summers, MIT and NBER, examines some aspects of the indexation of public and private pensions. He concludes that alternative indexing arrangements may have far less impact on actual patterns of risk bearing than is usually thought to be the case and that, insofar as the introduction of inflation indexing has real effects, there is no presumption that these effects are beneficial. The absence of indexed private pensions may not necessarily reflect market failure but rather may reflect the tendency of competitive capital markets to allocate risks efficiently.

Indexation is also the subject of Robert C. Merton's paper, "On Consumption-Indexed Public Pension Plans" (NBER Working Paper No. 910). Merton, of MIT and NBER, considers the merits and feasibility of a mandatory fully funded savings plan in which required contributions and benefits are indexed to aggregate per capita consumption.

Finally, Louis Dicks-Mireaux, Harvard University and NBER, and Mervyn A. King, University of Birmingham and NBER, in their paper, "Portfolio Composition and Pension Wealth: An Econometric Study" (NBER Work-

ing Paper No. 903), examine the impact of pension wealth on the composition of household asset holdings. Using cross-sectional data for 10,118 Canadian households, they find that whereas there seems to be an identifiable effect of pension wealth on total saving, the effect on portfolio composition is less significant and is mainly in terms of the number and combination of different assets held.

Social Accounting for Transfers

NBER's Conference on Research in Income and Wealth sponsored a two-day meeting on social accounting for transfers in Madison, Wisconsin, on May 14–15. The formal program was:

SESSION I—MEASUREMENT OF TRANSFERS

Robert Eisner, Northwestern University, "Transfers in a Total System of Accounts"
Discussant: David T. Dobbs, Bureau of Economic Analysis
Edward Budd, Pennsylvania State University, Daniel Radner, Social Security Administration, and T. Cameron Whiteman, Office of the Assistant Secretary for Planning and Evaluation, Department of Health and Human Services, "An Accounting Framework for Transfer Payments and Its Implications for the Distribution of Income"
Discussant: Robert Lampman, University of Wisconsin
Harvey Galper, Advisory Commission on Intergovernmental Relations, and Eric Toder, Office of Tax Analysis, Department of the Treasury, "Transfer Elements in the Taxation of Income from Capital"
Discussant: Benjamin Okner, Office of the Secretary, Department of the Treasury

SESSION II—IN-KIND TRANSFERS:
MEASUREMENT AND DISTRIBUTION

Timothy Smeeding, University of Utah and ASA–Census Research Fellow: "Approaches to Measuring and Valuing In-Kind Subsidies and the Distribution of Their Benefits"
Discussant: Jan Peskin, Congressional Budget Office
Edgar Olsen and Kathy York, University of Virginia, "The Effect of Different Measures of Benefit on Estimates of the Distributive Consequences of Government Programs"
Discussant: Robert Hutchens, Cornell University
James Morgan, University of Michigan, "Individual Leisure and Family Well-Being"
Discussant: Daniel S. Hamermesh, Michigan State University and NBER

SESSION III—DISTRIBUTIONAL IMPACTS OF TRANSFERS

Sheldon Danziger and Eugene Smolensky, University of Wisconsin; Jacques van der Gaag, World Bank; and Michael Taussig, Rutgers University, "Income Transfers and the Economic Status of the Aged"
Discussant: Barbara Torrey, Office of Management and Budget
David Betson and Robert Haveman, University of Wisconsin, "The Role of Income Transfers in Reducing Inequality between and within Regions"
Discussant: Peter Gottschalk, Bowdoin College

SESSION IV—SOCIAL SECURITY AND INTERTEMPORAL ISSUES

Robert Moffitt, Rutgers University, "Time-Series Trends in Social Security Wealth by Cohorts"
Discussant: Joseph Quinn, Boston College
Jennifer Warlick, University of Wisconsin, and Richard Burkhauser, Vanderbilt University, "Raising the Normal Retirement Age under Social Security: A Life-Cycle Analysis"
Discussant: Denis Kessler, University of Paris

In his paper, Eisner develops an expanded set of national accounts to include all transfers, or income received by agents who did not provide services in exchange for that income. He includes in-kind benefits and transfers within each sector of the economy, for example from nonprofit firms to households and others. For 1976, this expanded accounting increases total transfers from one-sixth to over one-half of the appropriate total income measure.

Based on a detailed recalculation of income flow for 1972, Budd and his coauthors examine the distribution of income (under various definitions of income). They find that the tax system and age-related transfers work toward reducing the inequality in the distribution of household income. Indeed, household income is distributed more evenly than "productive income" (earnings, dividends, and interest) because total assets, not related to age, are equalizing.

Galper and Toder argue that the tax on capital produces net transfers from the wealthy to the rest of the population by distorting the choice of assets (held disproportionately by the wealthy) in favor of lower-yielding (pretax) securities. They estimate that this distortion resulted in a net transfer of $37 billion in 1979, with the wealthiest (assets over $1 million) providing the largest transfers.

Smeeding presents a number of alternative ways to value in-kind subsidies, particularly subsidies for health and housing. He calculates both direct and indirect tax expenditure subsidies, separately and in total. Smeeding finds that direct subsidies equalize the distribution of income while indirect subsidies are disequalizing. In total, persons in the lowest and highest fifths of the income distribution benefit most relative to others.

Olsen and York estimate the cash value of subsidies for housing: (1) as the difference between what the rental for a comparable unit would be, minus the rent paid by the recipient of the subsidy; and (2) based on families' utility functions. The correlations among these measures are high for subsidized housing but not for rent-controlled units. This suggests the importance of providing correct bases for measures of net benefits.

Morgan's paper presents the results of various surveys on the amount of time and money transferred among households. He then estimates a life cycle of intrafamily transfers. Both sexes receive net transfers during youth and old age, but the path of transfers by age is flatter for women than for men. Valuing time at home in 1979, Morgan finds that net intrafamily transfers were $700 billion that year.

In their study, Danziger and his coauthors readjust the 1973 Consumer Expenditure Survey to derive measures of consumption rather than spending. They then calculate averages and distributions of consumption and income by age group. The differences among the measures are small; the main difference, by age group, comes from adjusting incomes for differences in family size. This calculation makes the economic status of the elderly appear little worse than that of the nonaged.

Betson and Haveman's work shows that only 2 percent of inequality across people is due to interstate differences in incomes. While interstate differences among the means and distributions of incomes decreased between 1967 and 1979, transfers during that period contributed little to the equalization.

Moffitt examines differences in Social Security wealth over time. He finds that the first cohort eligible for benefits (in the early 1940s) got less of a subsidy from later generations than did the cohorts retiring in the 1950s and 1960s. This is because the first group contained very few Social Security recipients. The growth rate of Social Security wealth by cohort reached nearly zero in the late 1970s.

The final paper, by Warlick and Burkhauser, analyzes the savings that would accrue to the Social Security system if the normal retirement age were raised to 68. Those savings are measured by the difference in total benefits that a retired worker could reasonably expect to receive over the entire period of retirement under current law and benefits received under the new proposal. The analysis shows that single-period measures of savings overstate, by a factor of five, actual savings, which are in the range of 20 percent according to the multiperiod measure. The analysis further argues that the burden of the costs of the proposal, from the viewpoint of the worker, will fall on low-wage workers unless they avail themselves of the SSI program that has had a history of low participation rates.

Conference Calendar

Each *Reporter* will include 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 Fall 1982 issue of the *Reporter* is September 15. If you have any questions about procedures for submitting materials for the calendar, please call Kirsten Foss at (617) 868-3974.

August 16–19, 1982
Annual Meeting, American Statistical Association*

August 25–27, 1982
Taxation in Federal Systems, International Seminar in Public Economics

August 31, 1982
Exchange Rate Regimes and Policy Interdependence, IMF/NBER

September 16–17, 1982
Panel on Economic Activity, Brookings Institution

September 22–24, 1982
Annual Conference, National Association of Business Economists*

October 8, 1982
Corporate Capital Structure in the United States (Preconference Meeting), NBER

October 15–16, 1982
Pension/Labor Conference, NBER

October 16–20, 1982
Annual Conference, American Bankers Association

October 20, 1982
Policy Forum: Pension Asset Management Issues, Employee Benefits Research Institute

October 24–28, 1982
Annual Conference, National Tax Association*

November 5–6, 1982
Incentive Effects of Government Spending, NBER

November 10–12, 1982
State Corporate Income Taxes, Hoover Institution

November 12, 1982
Program Meeting: Labor Studies, NBER

November 15–16, 1982
Minority Youth Unemployment (Preconference Meeting), NBER

November 17–19, 1982
Annual Meeting, International Association of Energy Economists

November 19–20, 1982
50th Anniversary of Berle and Means's book, *The Modern Corporation and Private Property*, Hoover Institution

December 3–4, 1982
U.S. Trade Relations, NBER

December 9–10, 1982
Research in Labor Economics, NBER

December 28–30, 1982
Annual Conference, American Economic Association*

January 6–7, 1983
Corporate Capital Structures in the United States, NBER

January 20–21, 1983
Labor Economics, Hoover Institution

March 24–26, 1983
Pension/Labor Conference, NBER

April 21–22, 1983
Minority Youth Unemployment, NBER

June 27–28, 1983
International Seminar on Macroeconomics, NBER

August 15–18, 1983
Annual Meeting, American Statistical Association*

September 1983
First Quarter Century of Cliometrics, NBER

October 2–6, 1983
Annual Conference, National Tax Association*

October 14–15, 1983
Business Cycle Conference, NBER

December 28–30, 1983
Annual Conference, American Economic Association*

March 16–17, 1984
Public Pensions, NBER

August 13–16, 1984
Annual Meeting, American Statistical Association*

October 25–29, 1984
Annual Conference, National Tax Association*

December 28–30, 1984
Annual Conference, American Economic Association*

August 11–15, 1985
Annual Meeting, American Statistical Association*

December 28–30, 1985
Annual Conference, American Economic Association*

Open conference, subject to rules of the sponsoring organization.

Bureau News

Tax Researchers Convene

Members and guests of NBER's Program in Taxation met in Cambridge on April 15 and 16. The agenda for the meeting was:

Michael J. Boskin, Stanford University and NBER, and Michael D. Hurd, Stanford University, "The Effect of Social Security on Retirement in the Early 1970s" (NBER Working Paper No. 659)
Discussant: Jerry A. Hausman, MIT and NBER

Joseph E. Stiglitz, Princeton University and NBER, "Modeling the Effects of Capital Gains Taxes on the Accrual and Realization of Capital Gains"

Panel Discussion: Safe Harbor Leasing
Stewart Myers, MIT and NBER; Emil Sunley, Deloitte, Haskins and Sells; Alvin Warren, Harvard Law School; and Alan J. Auerbach, Harvard University and NBER

After Dinner Remarks: "Recent Tax Developments," Gregory Ballentine, Deputy Assistant Secretary for Tax Policy, U.S. Department of Treasury

Patric H. Hendershott, Ohio State University and NBER, and James D. Shilling, Purdue University, "The Impacts on Capital Allocation of Some Aspects of the Economic Recovery Tax Act of 1981" (NBER Working Paper No. 825)
Discussant: Joel Slemrod, University of Minnesota and NBER

Roger H. Gordon, Bell Labs and NBER, "Assessing the Risk of Corporate Bankruptcies in the Current Recession"
Discussant: John B. Shoven, Stanford University and NBER

Lunch Remarks: "Possibilities for Indexing Income from Capital in Canada," John Bossons, University of Toronto

Ronald C. Fisher, Michigan State University, "Local Government Demand Studies with Intergovernmental Tax Incentives"
Discussant: Charles Clotfelter, North Carolina University and NBER

James M. Poterba, Oxford University, and Lawrence H. Summers, MIT and NBER, "Dividend Taxes, Corporate Investment, and Q" (NBER Working Paper No. 829)
Discussant: Fischer Black, MIT and NBER

The paper by Boskin and Hurd investigates the relationship between retirement and Social Security. The data, analyzed in several ways, suggest a positive relationship between benefits and retirement probabilities. For example, the changes in benefits in the early 1970s explain much of the decline in labor force participation among older men during that period. The paper concludes that both declining participation in the labor force and a portion of increasing Social Security costs during the 1970s were caused by the level of retirement, induced by the increase in benefits.

Stiglitz examines various aspects of the tax on capital gains, particularly its effect on portfolio strategies, capital market equilibrium, and macroeconomic equilibrium in the economy. He concludes that lowering the tax on long-term gains may indeed increase the turnover of securities. However, "the present discounted value of the revenues generated by the capital gains tax may well be negative, and in any case is likely to be lowered by a reduction in the tax rate."

The afternoon concluded with a discussion of safe harbor leasing, the provision of the 1981 Economic Recovery Tax Act that liberalizes the terms of use of sale/leaseback agreements by businesses. The 1981 Act allows this means of transferring tax deductions to be used by any company with taxable income. The panel of tax experts, all of whom have done research on safe harbor leasing, looked at current practice under the new provisions and discussed their impact on economic efficiency.

Following an informal and lively discussion of current tax policy issues in the evening of the first day, the meeting resumed with a paper dealing with certain aspects of the Economic Recovery Tax Act. Hendershott and Shilling concern themselves with the long-run impact of the Act on the allocation of a fixed stock of capital: owner-occupied housing, rental housing, and nonresidential capital. Looking specifically at accelerated depreciation and the reduced maximum tax on unearned income, the authors find: "As a result of the Act, the net (of depreciation) user costs for the three types of capital will almost be equalized."

Gordon's paper deals with one implication of the current recession: an increase in the bankruptcy rate. In this recession, both nominal and real interest rates are at unprecedented levels, and short- relative to long-term rates have been unusually high. These factors, taken together, lead to the highest forecasted rate of business failure in twenty years.

During lunch, Bossons discussed his attempt to design a scheme of partial tax indexation for Canada that would be superior to the existing system while minimizing revenue loss, windfalls, and other undesirable side effects. He is now doing further work on such a plan with James E. Pesando of the University of Toronto and John Whalley, University of Western Ontario.

Next, Fisher described his study of the effect of intergovernmental tax incentives on local government taxes and expenditures. His paper presents estimates of the incentive effects of a particular program, Michigan's "circuit breaker program." The results imply that net per capita property taxes increased between 6 and 15 percent as a result of that program.

The final paper, by Summers and Poterba, distinguishes between two views of dividend taxation. Extending Tobin's q theory to incorporate both corporate and personal taxation, and using British data on postwar corporate

tax rates, the authors find that dividend taxes have indeed had important effects on corporate investment decisions.

In addition to the authors and discussants, the following NBER program members participated in the two-day meeting: Daniel J. Frisch, University of Washington; David F. Bradford, Don Fullerton, and Harvey S. Rosen, Princeton University; Jerry R. Green and Martin Feldstein, Harvard University; Laurence J. Kotlikoff, Council of Economic Advisers; Charles E. McLure, Jr., Hoover Institution; Shlomo Yitzhaki, Hebrew University; and David G. Hartman and Daniel Feenberg. Also attending were: Thomas Barthold, Dartmouth College; Larry Dildine, Department of the Treasury; Harvey Galper, Advisory Commission on Intergovernmental Affairs; Frederic W. Hickman and Bradford L. Ferguson, Esqs., Hopkins and Sutter; Daniel Rubinfield, University of Michigan Law School; William Andrews, Stanley Surrey, and Bernard Wolfman, Harvard Law School; and Kevin E. Villani, Department of Housing and Urban Development.

Labor Studies Group Meets

NBER's Program in Labor Studies held a meeting in Cambridge on April 23 to discuss recent research. The following papers were presented:

Edward P. Lazear, University of Chicago and NBER, "The Excess Sensitivity of Layoffs and Quits to Demand" (NBER Working Paper No. 864, coauthored with Robert E. Hall)

Ann P. Bartel, Columbia University and NBER, and Lacy Glenn Thomas, Columbia University, "OSHA Enforcement Activities, Industrial Compliance, and Workplace Injury Rates"

Frank Stafford, University of Michigan, "Micro Productivity Analysis"

Robert J. Willis, State University of New York, Stonybrook, and NBER, "The Direction of Intergenerational Transfers and Demographic Transition"

The Lazear–Hall paper looks at the bilateral monopoly problem in worker–firm relations, exemplified by excessive layoffs in bad times and excessive quits in good times. The institutions designed to avert the associated inefficiency (of unequal information) still cannot mimic the separation decisions made with perfect information and a first–best allocation rate. Thus, simple employment rules based on predetermined or indexed wages in many cases may be the most desirable among the class of feasible employment arrangements, according to the authors.

Bartel develops a model that can distinguish between two possible explanations of OSHA's apparent failure to affect injury rates: (1) OSHA is unable to generate compliance with its standards because its enforcement mechanism is weak; (2) OSHA enforcement efforts lead to compliance, but conformity with (in general) safety standards for equipment has little effect on injury rates. The preliminary empirical work supports the second hypothesis.

Stafford asks: what is the potential for use and development of microeconomic theory to analyze the resource allocation problems within the firm? To create a database for micro productivity analysis, one can use the same approach that is used to analyze households: either do industry-specific studies, or use a sample of establishments, as one would do a door-to-door sample of households.

The Willis paper is a summary and extension of his recent work and related literature attempting to integrate micro theories of fertility and family behavior into overlapping generations models. His goal is to develop a theory, capable of taking explicit account of the interaction between the family and other social and economic institutions, that can deal with the causes and consequences of changes in family fertility behavior, investments in human and physical capital, and intergenerational transfers.

Other NBER program members attending the labor meeting were: Joseph Altonji, Columbia University; Charles Brown, University of Maryland; James M. Brown, Princeton University; Ronald G. Ehrenberg and Olivia S. Mitchell, Cornell University; David Ellwood, Richard B. Freeman, Zvi Griliches, James L. Medoff, and David A. Wise, Harvard University; Herschel I. Grossman, Brown University; Thomas L. Steinmeier, Dartmouth College; Robert Topel, University of Chicago; Uri Ben-Zion, York University; Frank R. Lichtenberg and Casey Ichniowski. Guests included: Katharine G. Abraham, MIT; David Bloom, Carnegie–Mellon University; Allesandra Venturini, Brown University; Shelly Lundberg, University of Pennsylvania; and George Johnson, University of Michigan.

Financial Economists Gather in Cambridge

Under the chairmanship of Program Director Benjamin M. Friedman, members of NBER's Program in Financial Markets and Monetary Economics met in Cambridge on May 7 to discuss their work. The day's agenda was:

Benjamin M. Friedman, Harvard University and NBER, "Federal Reserve Policy, Interest Rate Volatility, and the U.S. Capital Raising Mechanism" (NBER Working Paper No. 917)

Discussant: Edward J. Kane, Ohio State University and NBER

Stewart C. Myers, MIT and NBER, and Nicholas J. Majluf, "Stock Issues and Investment Policy When Firms Have Information that Investors Do Not Have" (NBER Working Paper No. 884)

Discussant: Roger H. Gordon, Bell Labs and NBER

Lawrence H. Summers, MIT and NBER, "Inflation and the Valuation of Corporate Equities" (NBER Working Paper No. 824)

Discussant: Bennett T. McCallum, Carnegie-Mellon University and NBER

John H. Makin, University of Washington and NBER, "Effects of Inflation Control Programs on Expected Real Interest Rates"

Discussant: Andrew B. Abel, Harvard University and NBER

Ken Garbade, New York University, and William Silber, New York University and NBER, "Price Movements and Price Discovery in Futures and Cash Markets"

Discussant: Carl E. Walsh, Federal Reserve Bank of Kansas City and NBER

Friedman's paper asks whether the increased volatility of interest rates over the last few years has impaired market mechanisms for raising long-term business capital. He reaches three conclusions: (1) nonfinancial corporations now finance less of their external funds requirements at long term than previously; (2) underwriters of high-grade corporate bonds have increased the spread of a new issue's yield over the prevailing market yield on comparable bonds; and (3) the volatility of rates has not particularly affected investors' portfolio behavior in the bond market.

The paper by Myers and Majluf considers a firm that must issue common stock to raise cash in order to take advantage of a valuable investment opportunity. It is assumed that management knows more about the firm's value than do the potential investors; investors interpret the firm's actions rationally. Under these assumptions, firms may refuse to issue stock and therefore may pass up valuable investment opportunities. The model suggests explanations for several aspects of corporate financing behavior, including the tendency to rely on internal sources of funds.

Summers's paper looks at the relationship between inflation and the return on corporate securities. Conventional financial theory holds that equity should be a good inflation hedge, yet there has been a negative relationship between inflation and stock market returns. Summers's results from the 1970s show that the interaction of inflation and taxation accounts for a large part of the decline in the stock market in the last decade. A significant part of the remaining decline may be caused by increasing investor awareness of the need to adjust for historic cost depreciation.

Makin investigates the effects of programs of monetary restraint and attendant policies on expected real interest rates. He tests hypotheses that money surprises and anticipated inflation are both inversely related to real interest rates while total credit demand relative to GNP is positively related. Based on quarterly data from 1959–80, Makin confirms these hypotheses. He finds that a program of inflation control that involves monetary stringency may produce some temporary upward pressure on real rates so that, if such a program is implemented, careful attention to implications of fiscal policy for total credit demand is warranted.

Garbade and Silber focus on the "risk transfer" and "price discovery" functions of futures markets. Their model describes the interrelationship between cash market prices and futures prices of storable commodities. With evidence for seven commodities traded in U.S. futures markets, the results indicate that hedgers face nontrivial risk exposure over short time intervals in the futures market for grains. In four of the commodities, futures markets lead price movements in respective cash markets; for the other three, the pricing process is more symmetrical.

Other NBER participants at the meeting were: David S. Jones, Board of Governors of the Federal Reserve System; William Poole, Brown University; V. Vance Roley, Federal Reserve Bank of Kansas City; Paul Wachtel, New York University; and David G. Hartman and Anna J. Schwartz.

Reprints Available

The following NBER Reprints, intended for nonprofit education and research purposes, are now available. (Previous issues of the NBER Reporter list titles 1–254 and contain abstracts of the Working Papers cited below.)

255. "An Exploration of the Dynamic Relationship between Health and Cognitive Development in Adolescence," by Robert A. Shakotko, Linda N. Edwards, and Michael Grossman, 1981 (NBER Working Paper No. 454)

256. "The Effects of Government Regulation on Teenage Smoking," by Eugene M. Lewit, Douglas Coate, and Michael Grossman, 1981 (NBER Working Paper No. 655)

257. "Economic Growth and the Rise of Service Employment" by Victor R. Fuchs, 1981 (NBER Working Paper No. 486)

258. "The Impact of Collective Bargaining: Illusion or Reality?" by Richard B. Freeman and James L. Medoff, 1981 (NBER Working Paper No. 735)

259. "The Decline in Aggregate Share Values: Taxation, Valuation Errors, Risk, and Profitability," by Patric H. Hendershott, 1981 (NBER Working Paper No. 370)

260. "Government Deficits and Aggregate Demand," by Martin Feldstein, 1982 (NBER Working Paper No. 435)

261. "Anticipated Money, Inflation Uncertainty, and Real Economic Activity," by John H. Makin, 1982 (NBER Working Paper No. 760)

262. "Why U.S. Wage and Employment Behavior Differs from That in Britain and Japan," by Robert J. Gordon, 1982 (NBER Working Paper No. 809)

263. "The Elusive Incidence of the Corporate Income Tax: The State Case," by Charles E. McLure, Jr., 1981 (NBER Working Paper No. 616)

264. "On the Estimation of Structural Hedonic Price Models," by James N. Brown and Harvey S. Rosen, 1982 (NBER Technical Working Paper No. 18)

265. "The Sensitivity of Consumption to Transitory Income: Estimates from Panel Data on Households," by Robert E. Hall and Frederic S. Mishkin, 1982 (NBER Working Paper No. 505)

266. "The Capitalization of Income Streams and the Effects of Open-Market Policy under Fixed Exchange Rates," by Maurice Obstfeld, 1982 (NBER Working Paper No. 528)

Bureau Books

Friedman Volume Published

The Changing Roles of Debt and Equity in Financing U.S. Capital Formation, edited by Benjamin M. Friedman, is now available from the University of Chicago Press at a cost of $11.00. The six papers in this volume make accessible to a broad audience new research results showing how the American economy's financing of its capital formation has changed in recent years. Although the capital formation issue has already received substantial attention in the business press as well as in scholarly research, much of the resulting discussion has ignored financing issues. The financing, however, is central. Financial conditions importantly determine both the amount and the composition of the capital formation that the economy as a whole undertakes. Moreover, it is becoming increasingly apparent that the financing of capital formation will not merely continue along traditional patterns.

Three of the six papers focus on the U.S. markets for debt and equity securities and, more specifically, on the way in which these markets price securities so as to determine the cost of financing capital formation. Patric H. Hendershott examines the patterns that have characterized the experience of these markets during the last half-century. John G. Cragg and Burton G. Malkiel present empirical results showing the role of expectations in determining prices of securities and the relationship of the market's expectations to analysts' forecasts. Zvi Bodie shows to what extent conventional financial instruments

have failed to provide investors with a hedge against inflation and considers new ways to meet the inflation challenge.

The other three papers focus on how U.S. corporations' financing of capital formation has responded to this market environment. John H. Ciccolo presents new data series showing how U.S. corporate balance sheets have changed during the last half-century. Martin Feldstein and Stephanie Seligman investigate the implications for capital formation associated with the increasing importance of unfunded pension obligations in corporations' financial structures. Finally, Benjamin Friedman documents a long-standing regularity between outstanding debt securities and economic activity in the United States and explores the implications of this restraining influence on the financing of capital formation.

All six papers stand out not only for their sharp focus on problems related to financing capital formation but also for their success in bringing the latest available empirical evidence to bear on this current economic issue. While the six papers present sophisticated economic theory and empirical research, they do so in layman's language—in terms understandable to the average reader of the *Wall Street Journal.* The result is a work that will be of special interst to practicing financial planners as well as scholars and researchers in finance.

Benjamin M. Friedman is professor of economics at Harvard University and director of the NBER Program in Financial Markets and Monetary Economics. He is the author of *Economic Stabilization Policy* and *Monetary Policy in the United States: Design and Implementation,* and the editor of *New Challenges to the Role of Profits.*

... Information and Uncertainty

The Economics of Information and Uncertainty, the final volume in the Universities–National Bureau Conference series, is now available from the University of Chicago Press at a cost of $48.00. The eight papers and associated commentaries that compose this volume make pioneering contributions to a rapidly developing field of ever-widening interest; while they cover a broad range of topics, they share a strong central concern for the role of incentives, risk, and risk sharing in organizational structure.

Among the topics covered are asset prices in a production economy, planning and market structure, moral hazard, entrepreneurial behavior under uncertainty, and corporate financial structure and managerial incentives. The editor's introduction places all the papers in a perspective of the literature, adding to the volume's usefulness. The result is a stimulating volume certain to be of particular interest to students of the theory of finance, of organization theory, and of the economics of insurance.

John J. McCall, editor of this volume, is a professor of economics at the University of California, Los Angeles.

Import Competition and Response

An NBER Conference Volume edited by Jagdish N. Bhagwati, *Import Competition and Response*, is now available from the University of Chicago Press. The clothbound version is priced at $32.50, the paperback at $15.00.

The papers in this volume, by a number of leading international trade theorists, present the first significant theoretical work to be done on a topic of considerable interest: import competition. Nine theoretical papers, on topics ranging from protectionist lobbying to adjustment costs, are synthesized in the editor's introduction, which also contrasts these contributions with the traditional classroom analysis of import competition.

The three major empirical studies in the book examine U.S. adjustment assistance policies, detail secular adjustment to import competition in a Lancashire textile town, and explore protectionist tendencies in the European community. This volume represents a major contribution to a very important subject; it should prove indispensable for anyone who wishes to think clearly about import competition and about how economies do—and should—respond to it.

Jagdish N. Bhagwati is the Arthur Lehman Professor of Economics at Columbia University and the editor of the *Journal of International Economics*.

Friedman and Schwartz Volume Available

Monetary Trends in the United States and United Kingdom: Their Relation to Income, Prices, and Interest Rates, 1867–1975, by Milton Friedman and Anna J. Schwartz, is now available from the University of Chicago Press at a cost of $48.00. This volume, the culmination of more than 25 years of research on money and its effects, is the final installment in a now-classic series of books that had their origin in new estimates of the quantity of money in the United States. The study provides a statistical and theoretical analysis covering a long period of time—allowing the authors to purge the data of cyclical fluctuations so that long-term trends could be examined. It also provides a cross-country comparison.

The authors establish the theoretical framework for their empirical study with a comprehensive presentation of the quantity theory of money, including a discussion of recent literature. They then describe their statistical procedures and their data. Presentation of the broad trends and fluctuations in money, income, and prices over a century is followed by a detailed examination of some basic propositions in monetary theory: the determinants of money demand; the financial links between the United States and the United Kingdom; the transmission process from money to income, output, and prices; the relationship between money and interest rates; and the nature of long swings.

Among their important conclusions: a single demand function for money is applicable to the whole century covered by the book and to both the United States and the United Kingdom. The only notable difference between the two nations is in the elasticity of demand for money with respect to real per capita income, slightly over unity for the United States and less than unity for the United Kingdom. With the exception of the interwar period for the United States, the data conform far better to a quantity theory than to a Keynesian approach to the determinants of income, output, and prices. Except for that idiosyncratic period, price change and output move in opposite directions. Before the 1960s, nominal interest rates were not appreciably affected by expectations of inflation or deflation; they have been dominated by such expectations since.

Long awaited, this volume presents a great deal of new evidence that is valuable both to students of the quantity theory and to anyone interested in the effects of money on the economy.

Milton Friedman, winner of the Nobel Prize in economics, is a senior research fellow at the Hoover Institution (Stanford University), Paul Snowden Russell Distinguished Service Professor of Economics at the University of Chicago, and research associate emeritus of NBER. Anna J. Schwartz is an NBER research associate in the international studies and financial markets programs.

Current Working Papers

Technical Papers Series

Additional studies in the NBER Technical Working Papers series are now available (see previous issues of the *NBER Reporter* for other titles). Like NBER Working Papers, these studies may be obtained by sending $1.50 per paper to: Technical Working Papers, National Bureau of Economic Research, 1050 Massachusetts Avenue, Cambridge, MA 02138. Prepayment is required for all orders under $10.00.

Using the Information on the Moments of Disturbances to Increase the Efficiency of Estimation

Thomas E. MaCurdy
Technical Working Paper No. 22
May 1982

This study considers the estimation of both regression and simultaneous equations that may involve nonlinearities in parameters and variables. For a wide range of assumptions concerning the distributional properties of disturbances, this analysis develops new estimators whose efficiencies dominate those associated with the estimators obtained by familiar least squares and instrumental variable procedures. Essentially, the only time one cannot improve the efficiency of estimation using the methods proposed in this paper is in those special situations in which the familiar procedures yield estimators that are asymptotically efficient.

Stochastic Capital Theory: Comparative Statics

W. A. Brock, Michael Rothschild, and **Joseph E. Stiglitz**
Technical Working Paper No. 23
May 1982

Introductory lectures on capital theory often begin by analyzing the following problem: I have a tree that will be worth X(t) if cut down at time t; if the discount rate is r, when should the tree be cut down and what is the present value of such a tree? The answers to these questions are straightforward. Since at time t a tree that I plan to cut down at time T is worth $e^{rt}e^{-rT}X(T)$, I should choose the cutting date T^* to maximize $e^{-rT}X(T)$; at $t < T^*$ a tree is worth $e^{rt}e^{-rT*}X(T^*)$. In this paper we analyze how the answers to these questions of timing and evaluation change when the tree's growth is stochastic rather than deterministic. Suppose a tree will be worth $X(t,\omega)$ if cut down at time t when $X(t,\omega)$ is a stochastic process. When should t be cut down? What is its present value?

We study these questions for trees that grow according to both discrete and continuous stochastic processes. The approach to continuous-time stochastic processes contrasts with much of the finance literature in two respects. First, we obtain sharp comparative statics results without restricting ourselves to particular stochastic specifications. Second, while the option pricing literature seems to imply that increases in variance always increase value, we show that an increase in the variance of a tree's growth has ambiguous effects on its value.

Working Papers Series

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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 March 1982 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 NBER.

Rational Expectations, the Expectations Hypothesis, and Treasury Bill Yields: An Econometric Analysis

David S. Jones and **V. Vance Roley**
Working Paper No. 869
March 1982

This paper tests the joint hypothesis of rational expectations and the expectations model of the term structure

for three- and six-month Treasury bills. It extends previous studies in three directions. First, common efficient markets–rational expectations tests are compared, and it is shown that four of the five tests considered are asymptotically equivalent and that the fifth is less restrictive than the other four. Second, the joint hypothesis is tested using weekly data for Treasury bills maturing in exactly 13 and 26 weeks beginning in 1970 and ending in 1979. In contrast, previous studies using comparable data have typically discarded 12/13 of the sample to form a nonoverlapping data set. Finally, a more complete set of possible determinants of time-varying term premiums is tested.

The Trade-Off between Wages and Employment in Trade Union Objectives

John Pencavel
Working Paper No. 870
March 1982

This paper demonstrates that, contrary to a widely held opinion, the determination of the goals of unions is fully amenable to empirical analysis. A characterization of the wage-and-employment-setting process in unionized markets is adopted and its qualitative implications are examined. The first-order condition for this model is fitted to time-series data on the newspaper industry in ten cities. The International Typographical Union's objective function reveals very restricted opportunities for substituting wages for employment in response to a change in the slope of the employer's labor demand function. Larger union locals place greater emphasis on wages versus employment than smaller union locals do.

Optimum Contracts for Research Personnel, Research Employment, and the Establishment of "Rival" Enterprises

Ariel Pakes and **Shmuel Nitzan**
Working Paper No. 871
March 1982
JEL Nos. 824, 621

This paper considers the problems of hiring scientists for research and development projects, taking explicit account of the fact that the scientist may be able to use in a rival enterprise the information acquired during the project. Management's problem is to determine an optimum labor policy for its project. The policy consists of an employment decision and a labor contract. Given optimum behavior, it is straightforward to analyze the effect of the potential for mobility of scientific personnel on project profitability and on research employment. We also formalize conditions under which one would expect to observe a scientist leaving his employer to set up (or join) a rival.

The Tax Treatment of Married Couples and the 1981 Tax Law

Daniel Feenberg
Working Paper No. 872
April 1982
JEL No. 323

Currently, U.S. federal income tax schedules do not maintain marriage neutrality; that is, tax liabilities depend upon marital status. This paper shows the extent and distribution of the departure from neutrality both under pre-1981 law and under the 1981 tax act. The new tax law establishes a secondary earner's deduction equal to 10 percent of the secondary earner's wages (up to $3000) and a more liberal child-care credit. The effects of these provisions on revenue, welfare, and the labor supply are also analyzed.

Aggregation and Stabilization Policy in a Multicontract Economy

Alan S. Blinder and **N. Gregory Mankiw**
Working Paper No. 873
April 1982
JEL No. 300

This paper presents a model of a multisector economy in which each sector is characterized by a different type of wage or price stickiness. The various sectors experience the same exogenous shocks and have the same money supply. The analysis shows that demand shocks pose no serious problems for stabilization policy. In contrast, supply shocks force the policymaker to choose between stability in one sector and stability in another. The analysis also shows that the economy cannot be usefully aggregated into a single sector model. Such an aggregation misleads the economist as to the underlying structure of the economy and obscures the trade-offs that the policymaker must confront. In particular, a feedback rule chosen on the basis of an aggregate model could be either better or worse than a passive policy.

Welfare Aspects of Government Issue of Indexed Bonds

Stanley Fischer
Working Paper No. 874
April 1982

The government's issue of bonds indexed to the price level has long been recommended by economists, to no

observed effect. Recently skepticism has been expressed about the real effects of such a government action, or indeed of any government financial intermediation. This paper examines two main approaches that might argue for the government's issue of indexed bonds. The first asks what financial intermediation can be provided by government that cannot be provided by the private sector. The answer is that the government can use its taxation powers to make possible intergenerational risk sharing; private markets cannot. This argument suggests that the government should issue bonds indexed to wage income. The second approach discusses optimal forms of government debt issue in light of the government's ability to manipulate the payoffs on debt with an uncertain real return. In this context indexed debt has the potential advantage of enforcing consistency in government financing and actions.

Risk Attitudes in Health: An Exploratory Study

Friedrich Breyer and **Victor R. Fuchs**
Working Paper No. 875
April 1982
JEL No. 913

Recent studies on human decisionmaking under uncertainty have revealed three typical behavioral principles: (1) the status quo is an important reference point ("target") for assessing outcomes; (2) for gains, that is, above-target payoffs, risk aversion is prevalent, but for potential losses risk seeking is prevalent; and (3) a tendency to give more weight or "marginal utility" to a small loss than there is to a gain of the same size.

We investigate whether and how these principles carry over from the money to the health context, examining the responses to a questionnaire by 325 patients from three outpatient facilities in Palo Alto, California. The questionnaire consisted of twelve hypothetical situations, each with the choice between two alternative modes of treatment for a supposed illness. In each case, one of the options promised a certain (favorable or unfavorable) health effect, the other one a probabilistic effect.

The majority of responses confirm the relevance for the health context of all three abovementioned principles. Risk aversion for gains, risk seeking for losses, and differences in the slope of the utility function were all significant and substantial in magnitude. When we try to trace differences in attitudes toward risk to demographic or socioeconomic characteristics of the respondents, we find that education is the most important correlate: the choices of people with more years of schooling show less risk aversion for gains and less risk seeking for losses and thus correspond to a more linear relationship between health and utility.

Economic Determinants of the Optimal Retirement Age: An Empirical Investigation

Gary S. Fields and **Olivia S. Mitchell**
Working Paper No. 876
April 1982

This paper examines how the structure of earnings and pension opportunities affects retirement behavior. We use a life-cycle model of labor supply, paying special attention to the institutional features of private pensions and Social Security benefits, to develop comparative dynamic predictions and to guide empirical modeling. We also use data from a new survey of workers and their income alternatives to implement the empirical model. Along the way, we highlight a number of interesting and little-known facts about older workers' income. Contrary to popular opinion we find that: private pensions are not always actuarially neutral; Social Security benefits do not typically decline (in present value terms) the longer retirement is deferred; and for many people, retirement income approaches and even exceeds net labor income. On the basis of empirical estimates of retirement parameters, we conclude that (1) people with higher base incomes retire earlier; and (2) those who have more to gain by postponing retirement retire later. These findings are relevant to proposed reforms of the Social Security system as well as to pension programs.

Capital Taxation

Martin Feldstein
Working Paper No. 877
April 1982
JEL Nos. 321, 323

This paper is an introductory chapter to a book that brings together twenty-two of my papers written between 1965 and 1981. It provides a summary of each paper and a more general discussion of the role of taxation in influencing the process of capital accumulation. The four sections of the forthcoming book are: (1) Household and Corporate Saving; (2) Portfolio Behavior; (3) Business Investment; and (4) Tax Incidence in a Growing Economy.

What! Another Minimum Wage Study?

Mary Eccles and **Richard B. Freeman**
Working Paper No. 878
April 1982
JEL No. 800

The Minimum Wage Study Commission was established in 1977 to aid Congress in investigating the effects

and possible consequences of two proposed changes in the minimum wage law: indexing the wage to inflation and providing for a youth differential. This paper seeks to determine to what extent the Minimum Wage Study Commission's work has been helpful in policy debate, and to compare the Commission's findings with those of the more conservative American Enterprise Institute.

Our overall finding is that the Commission's report appears to have had little or no impact on policy, but that policymakers still regard the report as a useful and credible examination of the effects of the minimum wage on the economy.

Piece Rate versus Time Rate: The Effect of Incentives on Earnings

Eric Seiler
Working Paper No. 879
April 1982
JEL No. 824

This paper presents a detailed examination of the effect of piece rates and other forms of incentive compensation on individual employee earnings. The sample group consists of over 100,000 employees in 500 firms in the footwear and men's and boys' clothing industries.

Two distinct incentive effects are observed. First, the earnings of incentive workers are more dispersed than the earnings of identical time workers both within firms and occupations. With the addition of controls for heterogeneity of individual characteristics between the two sectors, this greater variance is maintained. Second, incentive workers receive an earnings premium, in part to compensate for the greater variation in their income, and in part as a result of an incentive-effort effect. The incentive-earnings premium averages 14 percent controlling for individual characteristics, occupational classification, and individual firms. Subsequent decomposition of the incentive-earnings premium reveals that the compensating differential for variation in earnings accounts for a minority of the incentive-earnings premium. This supports the view that increased effort by incentive employees leads to relatively greater earnings.

Height and Per Capita Income

Richard H. Steckel
Working Paper No. 880
April 1982
JEL No. 042

As an aid to interpreting the results of height-by-age studies, this paper investigates the relationship between average height and per capita income. The relationships among income, nutrition, medical care, and height at the individual level suggest that average height is nonlinearly related to per capita income and that the distribution of income is an important determinant of average height. Empirical analysis rests on 56 height studies and estimates of per capita income for 20 developed or developing countries.

The Economic Foundations of East–West Migration during the Nineteenth Century

Richard H. Steckel
Working Paper No. 881
April 1982
JEL No. 042

This paper argues that latitude-specific investments in seeds and human capital provided an incentive for farmers to move along east–west lines. The incentives were greatest during the early and mid-1800s. Toward the end of the century migration patterns changed as farmers learned about farming in different environments, settlement reached the Great Plains and beyond, and farming declined in importance. Census manuscript schedules and Mormon family-group records form the basis for our empirical work.

The Effect of Liquidity Constraints on Consumption: A Cross-Sectional Analysis

Fumio Hayashi
Working Paper No. 882
April 1982
JEL No. 023

Using a single-time, cross-section data set, this paper examines the effect of liquidity constraints on consumption expenditures. A reduced-form equation for consumption of high-saving households is estimated by the Tobit procedure to account for the selectivity bias. Since high-saving households are not likely to be liquidity-constrained, the estimated equation appropriately describes the ways that desired consumption, dictated by the life-cycle–permanent-income hypothesis, is related to the variables available in the cross-section data. Using the reduced-form equation to predict desired consumption, one finds the gap between desired and measured consumption to be most evident for young households.

Measuring the Fed's Revenue from Money Creation

Robert J. Barro
Working Paper No. 883
April 1982

The national income accounts include the Fed's payments to the Treasury as a component of corporate taxes. These payments constituted 22 percent of reported taxes on corporate profits in 1981. This paper discusses alternative concepts of inflationary finance. Measures for these concepts are reported for the post–World War II period.

Stock Issues and Investment Policy When Firms Have Information That Investors Do Not Have

Stewart C. Myers and **Nicholas J. Majluf**
Working Paper No. 884
April 1982
JEL Nos. 521, 522

This paper describes corporate investment and financing decisions when managers have inside information about the value of the firm's existing investment and growth opportunities but cannot convey that information to investors. Capital markets are otherwise perfect and efficient. In these circumstances, the firm may forego a valuable investment opportunity rather than issue stock to finance it. The decision to issue stock cannot fully convey the managers' special information. If stock is issued, the stock price falls. Liquid assets or financial slack are valuable if they reduce the probability or extent of stock issues. The paper also suggests explanations for some aspects of dividend policy and the choice of capital structure.

An Intertemporal Model of Saving and Investment

Andrew B. Abel and **Olivier J. Blanchard**
Working Paper No. 885
April 1982
JEL Nos. 023, 111, 321

The standard model of optimal growth, interpreted as a model of a market economy with infinitely long-lived agents, does not allow separation of the saving decisions of agents from the investment decisions of firms. Investment is essentially passive: the "one-good" assumption leads to a perfectly elastic investment supply; the absence of installation costs for investment leads to a perfectly elastic investment demand.

On the other hand, the standard model of temporary equilibrium used in macroeconomics characterizes both the savings–consumption decision and the investment decision, or, equivalently, derives a well-behaved aggregate demand that, in equilibrium, must be equal to aggregate supply.

Often, however, we want to study the movement of the temporary equilibrium over time in response to a particular shock or policy. The discrepancy between the treatment of investment in the two models makes it difficult to imbed the temporary equilibrium model in the growth model. This paper characterizes the dynamic behavior of the optimal growth model with adjustment costs. It shows the similarity between the temporary equilibrium of the corresponding market economy and the short-run equilibrium of standard macroeconomic models: consumption depends on wealth, investment on Tobin's q. Equilibrium is maintained by the endogenous adjustment of the term structure of interest rates. The paper then shows how the equivalence can be used to study the dynamic effects of policies; it considers various fiscal policies and exploits their equivalence to technological shifts in the optimal growth problem.

Interest Rate Implications for Fiscal and Monetary Policies: A Postscript on the Government Budget Constraint

Benjamin M. Friedman
Working Paper No. 886
April 1982
JEL No. 321

An earlier paper of mine investigated the quantitative implications, for the effectiveness of fiscal and monetary policies, of a model treating the determination of long-term interest rates by explicitly imposing the market-clearing equilibrium condition: the quantity of bonds issued by private borrowers equals the quantity purchased by lenders. One incomplete aspect of that investigation, however, was the failure to allow explicitly for the government budget constraint. This paper reports results based on an expanded model that also imposes an analogous market-clearing condition in the U.S. government securities market.

The explicit imposition of the government budget constraint makes a major difference for the simulated effectiveness of both fiscal and monetary policies—indeed, a greater difference than that due simply to using the supply–demand representation of the determination of the private bond rate in the earlier paper. As is to be expected on the basis of familiar economic theory, the effect of

imposing the government budget constraint is to make the real-sector effects of fiscal policy appear smaller and the real-sector effects of monetary policy appear greater.

The main message of these results is that, when relative asset stock effects are the heart of the issue—as is the case in analyzing the implications of the government budget constraint—models that are implicitly consistent with the relevant economic behavior are not the same as models that explicitly represent it.

Postwar Capital Accumulation and the Threat of Nuclear War

Joel Slemrod
Working Paper No. 887
May 1982
JEL No. 114

The hypothesis of this paper is that the performance and, in particular, the rate of capital accumulation of the postwar U.S. economy has been influenced by changes in the public perception of the threat of a catastrophic nuclear war. An increased threat shortens the expected horizon of individuals and firms and thus reduces the willingness to postpone present consumption in favor of investment.

The hypothesis is tested by expanding a standard savings function–estimation technique to include a measure of the perceived threat of nuclear war. Four alternative measures of the perceived threat are considered, all based on the setting of the clock published monthly in *Bulletin of the Atomic Scientists,* which reflects the editors' judgment about the likelihood of a nuclear conflict. The tests all support a large and statistically significant impact of the threat of nuclear war on the rate of private saving.

These tests are not viewed as conclusive evidence in favor of the economic impact of the perceived threat of nuclear war. Nevertheless, this research suggests that economists may have been overlooking an important source of variation in the postwar, postnuclear U.S. economy. Conceivably, it could affect not only the private savings rate but also such things as the level of investment in human capital, the level of asset prices, the term structure of interest rates, and the rate of inflation.

Time-Separable Preferences and Intertemporal-Substitution Models of Business Cycles

Robert J. Barro and **Robert G. King**
Working Paper No. 888
May 1982

Time separability of utility means that past work and consumption do not influence current and future tastes.

This form of preference does not restrict the size of intertemporal-substitution effects—notably, we can still have a strong response of labor supply to temporary changes in wages. However, there are important constraints on the relative responses of leisure and consumption to changes in relative price and permanent income.

When the usual aggregation is permissible, time separability has some important implications for equilibrium theories of the business cycle. Neglecting investment, we find that changes in perceptions about the future—which might appear currently as income effects—have no influence on current equilibrium output. With investment included, no combination of income effects and shifts to the perceived profitability of investment will yield positive comovements of output, employment, investment, and consumption. Therefore, misperceived monetary disturbances or other sources of changed beliefs about the future cannot be used to generate empirically recognizable business cycles.

Some richer specifications of intertemporal production opportunities may eventually yield more satisfactory answers. Because of the positive correlation between cyclical movements of consumption and work, equilibrium theories with time-separable preferences inevitably predict a procyclical behavior for the real wage rate, arising from shifts to labor's marginal product. Empirically, we regard the cyclical behavior of real wages as an open question. Aside from analyzing autonomous real shocks to productivity, we suggest that such shifts may occur as firms vary their capital utilization in response to intertemporal relative prices. However, we still lack some parts of a complete theory.

Inflationary Finance under Discretion and Rules

Robert J. Barro
Working Paper No. 889
May 1982

Inflationary finance involves both the tax on cash balances from expected inflation and a capital levy from unexpected inflation. From the policymaker's standpoint of minimizing distortions, capital levies are attractive ex post.

In a full equilibrium two conditions hold: (1) the monetary authority optimizes, subject to people's expectations mechanisms; and (2) people form expectations rationally, given their knowledge of the policymaker's objectives. This paper contrasts the outcomes under discretionary policy with those generated under rules. In a purely discretionary regime, the monetary authority can make no

meaningful commitments about the future behavior of money and prices. Under an enforced rule, some guarantees are possible. Hence, the links between monetary actions and inflationary expectations can be internalized. There is a distinction between fully contingent rules and rules of simple form: a simple rule allows the internalization of some connections between policy actions and inflationary expectations, while discretion permits some flexibility of monetary growth.

Changes in American and British Stature since the Mid-Eighteenth Century: A Preliminary Report on the Usefulness of Data on Height for the Analysis of Secular Trends in Nutrition Labor Productivity, and Labor Welfare

Robert Fogel et al.
Working Paper No. 890
May 1982
JEL Nos. 040, 122, 840

This paper is a progress report on the usefulness of data on physical height for the analysis of long-term changes in the level of nutrition and health on economic, social, and demographic behavior. It is based on a set of samples covering the United States and several other nations from 1750 to the present. The preliminary results indicate that native-born Americans reached modern levels of height and nutrition by the time of the American Revolution, but there were long periods of declining nutrition and height during the nineteenth century. Similar cycling has been established for England. A variety of factors, including crop mix, urbanization, occupation, intensity of labor, and immigration affected the level of height and nutrition, although the relative importance of these factors has changed over time. There is evidence that nutrition affected labor productivity. In one of the samples, individuals who were one standard deviation above the mean height (holding constant the weight per inch of height) were about 8 percent more productive than individuals one standard deviation below the mean height. Another finding is that death was not random; analysis of data for Trinidad indicates that the annual death rate for the shortest quintile of males was more than twice as great as for the tallest quintile of males.

The Production and Inventory Behavior of the American Automobile Industry

Olivier J. Blanchard
Working Paper No. 891
May 1982
JEL Nos. 131, 631

Understanding inventory movements is central to understanding business cycles. This paper presents an empirical study of the behavior of inventories in the automobile industry; it finds that inventory behavior is well explained by the assumption of intertemporal optimization with rational expectations. The underlying cost structure of the auto industry appears to involve substantial costs when changing production or being away from target inventory; the latter is a function of current sales. Given this cost structure, whether inventory behavior is stabilizing or destabilizing depends on the characteristics of the demand process. In the automobile industry, inventory behavior is destabilizing; the variance of production is larger than the variance of sales.

Replacing the U.S. Income Tax with a Progressive Consumption Tax: A Sequenced General Equilibrium Approach

Don Fullerton, John B. Shoven, and **John Whalley**
Working Paper No. 892
May 1982

This paper examines the welfare consequences of changing the current U.S. income tax system to a progressive consumption tax. We compute a sequence of single-period equilibriums in which savings decisions depend on the expected future return to capital. In the presence of existing income taxes, the U.S. economy is assumed to lie on a balanced growth path. With the change to a consumption tax, individuals save more and initially consume less. As the capital stock grows, consumption eventually overtakes that of the original path, and the economy approaches the new balanced growth path with higher consumption and a greater capital stock. Both the transition and the balanced growth paths enter our welfare evaluations. We find that the discounted present value of the stream of net gains is approximately $650 billion in 1973 dollars, just over 1 percent of the discounted present value of national income. Larger gains occur if further reform of capital income taxation accompanies the change. We examine the sensitivity of the results, both to the design of the consumption tax and to the values of elasticity and other parameters. The paper also contains estimates of the time required to adjust from one growth path to the other.

Money Stock Control with Reserve and Interest Rate Instruments under Rational Expectations

Bennett T. McCallum and **James G. Hoehn**
Working Paper No. 893
May 1982
JEL No. 310

This paper presents a theoretical comparison of the potential effectiveness, in terms of money stock controlability, of interest rate and reserve instruments. Previous studies have been basically static; however, the present analysis is carried out in the context of a dynamic macroeconomic model with rational expectations. We pay particular attention to the distinction between contemporaneous and lagged reserve accounting (CRA and LRA). The criterion employed is the expectation of squared deviations of the (log of the) money stock from target values that are reset each period. Analysis in the basic model suggests the following substantive conclusions: (1) With a reserve instrument, monetary control will be more effective under CRA than LRA. (2) With a reserve instrument and LRA, control will be poorer than with an interest rate instrument. (3) For a wide range of parameter values, control will be better with a reserve instrument and CRA than with an interest rate instrument.

The Liquidity Trap and the Pigou Effect: A Dynamic Analysis with Rational Expectations

Bennett T. McCallum
Working Paper No. 894
May 1982
JEL Nos. 131, 031

A Keynesian idea of considerable historical importance is that, in the presence of a liquidity trap, a competitive economy may lack—despite price flexibility—automatic market mechanisms that tend to eliminate excess supplies of labor. The standard classical counterargument, which relies upon the Pigou effect, has typically been conducted in a comparative-static framework. But, as James Tobin has recently emphasized, the more relevant issue concerns the dynamic response (in "real time") of an economy that has been shocked away from full employment. This paper develops a dynamic analysis, in a rather standard model, under the assumption that expectations are formed rationally. The analysis permits examination of Tobin's suggestion that, because of expectational effects, such an economy could be unstable. Also considered is Martin J. Bailey's conjecture that, in the absence of a stock Pigou effect, Keynesian problems could be eliminated by expectational influences on disposable income.

Productivity Measurement Using Capital Asset Valuation to Adjust for Variations in Utilization

Ernst R. Berndt and **Melvyn A. Fuss**
Working Paper No. 895
May 1982

Although a great deal of empirical research on productivity measurement has taken place in the last decade, one issue that remains particularly controversial and decisive is the manner by which one adjusts the productivity residual for variations in capital and capacity utilization. In this paper we use the Marshallian framework of a short-run production or cost function with certain inputs, quasifixed, to provide a theoretical basis for accounting for variations in utilization. The theoretical model implies that the *value* of services from stocks of quasifixed inputs, rather than their *quantity*, should be altered. This represents a departure from most previous procedures that have adjusted the quantity of capital services for variations in utilization. In the empirical illustration, we employ Tobin's q to measure the shadow value of capital and find that for the U.S. manufacturing sector, we can attribute about 50 percent of the traditionally measured decline in productivity growth during 1973–77 to a decline in capacity utilization. Hence, adjusted for utilization, the 1973–77 productivity slowdown in U.S. manufacturing is considerably less than that measured by using traditional productivity accounting techniques.

Retirement Annuity Design in an Inflationary Climate

Zvi Bodie and **James E. Pesando**
Working Paper No. 896
May 1982
JEL Nos. 520, 921

This paper examines the tilt and risk–return characteristics of real retirement incomes provided by variable annuities tied to bills, long-term bonds, stocks, and a mixed portfolio that combines all three. The analysis emphasizes the riskiness of the real value of benefits provided by conventional nominal annuities. The Rockefeller Foundation Plan and the ad hoc cost-of-living adjustments made by many large firms are interpreted as representative market responses to increased inflation uncertainty. We examine the annuity designs implicit in these innovations and show them to be variants of the standard variable annuity.

The Taxation of Risky Assets

Jeremy I. Bulow and **Lawrence H. Summers**
Working Paper No. 897
June 1982
JEL No. 321

This paper reconsiders the effects of taxation on risky assets, recognizing the importance of variations in asset prices. We show that earlier analyses, which assumed that depreciation rates are constant and that the future price of capital goods is known with certainty, are very misleading as guides to the effects of corporate taxes. We then examine the concept of economic depreciation in a risky environment and show that depreciation allowances, if set ex ante, should be adjusted to take account of future asset price risk. Some empirical calculations suggest that these adjustments are large and have important implications for the burdens of, and nonneutralities in, the corporate income tax.

Intertemporal Substitution in Macroeconomics

N. Gregory Mankiw, Julio J. Rotemberg,
and **Lawrence H. Summers**
Working Paper No. 898
June 1982
JEL No. 130

Modern neoclassical theories of the business cycle posit that aggregate fluctuations in consumption and employment are the consequence of dynamic optimizing behavior by economic agents who face no quantity constraint. In this paper, we estimate an explicit model of this type. In particular, we assume that the observed fluctuations correspond to the decisions of an optimizing representative individual. This individual has a stable utility function that is additively separable over time but not necessarily additively separable into consumption and leisure. We estimate three first-order conditions representing three margins on which the individual is optimizing. He can trade off present consumption for future consumption, present leisure for future leisure, or present consumption for present leisure. Our results show that the aggregate U.S. data can only reluctantly be characterized by a model of this type. Not only are the over-identifying restrictions statistically rejected but also the estimated utility function is (often) not concave. Even when it is concave, the estimates imply that either consumption or leisure is an inferior good.

International Competition and the Unionized Sector

Gene M. Grossman
Working Paper No. 899
June 1982

This paper studies the wage and employment behavior of a unionized sector confronted by an intensification of international competition. After developing a formal model of a monopoly union subject to majority rule, I study the response of a unionized sector that operates under a seniority rule for layoffs and rehires to a trend decrease in the international price of its output. I provide the conditions necessary to validate the casual argument that majority voting in unions, combined with the seniority system, provides an explanation for the lack of union wage adjustment.

A modified version of the model allows the job queue to deviate from a strict seniority ranking. In this context I ask, what importance can be attached to the seniority system in determining the wage response to international competition?

Price Desynchronization and Price-Level Inertia

Olivier J. Blanchard
Working Paper No. 900
June 1982
JEL No. 130

If price decisions are not made continuously nor in perfect synchronization, then the process of adjustment of all prices to a new nominal level will imply temporary movements in relative prices. If that is the case, it might well be that, to avoid these movements in relative prices, each price setter will want to move his own price slowly compared to others. The results will be a slow movement of all prices to their new nominal level, and substantial inertia of the price level. This paper formalizes this intuitive argument and reaches four main conclusions:

(1) Even small departures from perfect synchronization can generate substantial price-level inertia.

(2) If price decisions are not synchronized, then even anticipated movements in money will usually have an effect on economic activity. However, it is possible to find paths of money deceleration that reduce inflation at no cost in output.

(3) Price desynchronization has implications for relative price movements as well as for the price level. Goods early in the chain of production have more price and profit variability than do goods further down the chain.

(4) Price inertia, if it is caused by price desynchronization, may be difficult to remove. It may well be that, given the timing decisions of others, no agent has an incentive to change his own timing decision: the time structure of price desynchronization may be stable.

Monetary and Fiscal Policy with Flexible Exchange Rates

William H. Branson and **Willem H. Buiter**
Working Paper No. 901
June 1982
JEL No. 431

In his classic paper, Mundell (1963) drew the implications of "perfect" capital mobility for the effectiveness of monetary and fiscal policy and the transmission of disturbances under floating or fixed exchange rates. With fixed rates, fiscal policy moves output but monetary policy does not; the converse is true under flexible rates. These results are among the most enduring and best-known in international economics.

Dornbusch (1976) made dynamic the flexible-rate version of the Mundell model. A crucial feature of both the Mundell and the Dornbusch analyses is the exclusion of the exchange rate from the money-market equilibrium condition. However, if the domestic price level is sensitive to changes in the exchange rate, then a movement in the rate changes real balances. Thus, fiscal policy influences real balances through the exchange rate, opening the way for effects on home output in the Mundell model or on the price level in the Dornbusch version.

In addition to excluding the exchange rate from money-market equilibrium, Mundell and Dornbusch do not consider constraints of long-run portfolio balance. In a stationary economy, these would require balance on the current account in the long-run equilibrium, while the Mundell–Dornbusch model permits current account imbalance indefinitely.

In this paper we revisit the Mundell–Dornbusch model to study its behavior with the price level dependent on the exchange rate, and with long-run portfolio balance constraints. We find that the flexible-rate fiscal policy result is a special case, dependent on the assumption of insensitivity of the price level to movement in the exchange rate.

Private Pensions and Public Pensions: Theory and Fact

Alan S. Blinder
Working Paper No. 902
June 1982
JEL Nos. 020, 820

This paper develops an economic theory of public and private pensions and compares the implications of the theory with some empirical evidence, both econometric and casual. The questions addressed include: Why are there private pensions? Why have they grown so rapidly in recent decades? Why do they have the particular features that they do? Why does the government intervene by regulating the provisions of private pensions and mandating a public pension system? What are the effects of private and public pensions on savings and retirement decisions?

Portfolio Composition and Pension Wealth: An Econometric Study

Louis Dicks-Mireaux and **Mervyn A. King**
Working Paper No. 903
June 1982

There has been very little study of the consequences of pension wealth for the *composition* of household portfolios. Using individual data for 10,118 Canadian households, we estimate the portfolio effect of pension wealth. Because most households do not own all of the assets that we are able to distinguish, we model asset demands as a mixed discrete–continuous portfolio choice problem. We find that, whereas there is an identifiable effect of pension wealth on total private savings, the effect on portfolio choice is less significant. Moreover, within the area of portfolio composition the main effect is in terms of the particular number and composition of assets held rather than the amount of any given asset as a proportion of total wealth.

Macroeconomic Implications of Alternative Exchange-Rate Models

John F. Helliwell and **Paul M. Boothe**
Working Paper No. 904
June 1982
JEL No. 431

In this paper we estimate and compare several alternative exchange-rate models that have received wide attention during the 1970s. In order to compare purchasing power parity (PPP), nominal interest rate parity, real interest rate parity, and portfolio balance models, we first strip each down to its essential core and undertake comparable single-equation tests of both "hard" and "easy" (more and less constrained) versions of each model. We then embed each of the "hard" versions in a new macroeconomic model of Canada and assess their implications for the impacts of monetary and fiscal shocks.

Using annual Canadian data from the 1950s and 1970s, all of the models have single-equation errors of about 3 percent, except for the "hard" versions of PPP and real interest parity, which are heavily rejected by the data. In a macroeconomic context, the models have modestly different implications for the effects of fiscal shocks, and diverge more widely under monetary shocks.

Are Bond-Financed Deficits Inflationary?
A Ricardian Analysis

Bennett T. McCallum
Working Paper No. 905
June 1982
JEL Nos. 300, 130

This paper considers the possible theoretical validity of the following "monetarist hypothesis": that a constant, positive, government budget deficit can be maintained permanently and without inflation if it is financed by the issue of bonds rather than money. The question is studied in a discrete-time, perfect-foresight version of the competitive equilibrium model of Sidrauski (1967), modified by the inclusion of government bonds as a third asset. It is shown that the monetarist hypothesis is invalid if the deficit is defined exclusive of interest payments but is valid under the conventional definition. It is also shown that the stock of bonds can grow indefinitely at a rate in excess of the rate of output growth, provided that the difference is less than the rate of time preference. In addition to the main analysis, the paper includes comments on alternative deficit concepts, a brief consideration of data pertaining to the announced budget plans of the Reagan Administration, and a new look at a much-studied issue: whether the operation of a Friedman-type constant money-growth rule (with nonactivist fiscal rules) would be dynamically feasible.

Inflation Uncertainty and Interest Rates: Theory and Empirical Tests

Richard Hartman and **John H. Makin**
Working Paper No. 906
June 1982
JEL No. 310

This paper develops two models, one involving risk neutrality and the other risk aversion, which suggest that inflation uncertainty affects interest rates. Both models give rise to essentially the same interest rate equation for estimation. Empirical evidence supports the hypothesis that inflation uncertainty affects interest rates. Interpreted in terms of the risk-neutral model, the empirical results suggest that inflation uncertainty has a negative impact on nominal interest rates and a positive impact on the expected real rate. If the results are interpreted in terms of the risk-averse model, inflation uncertainty has a negative impact on nominal interest rates. The expected real rate is not of direct interest in a risk-averse world.

The results raise real questions about the use of the Fisherian definition of the real interest rate in situations when there is uncertainty about inflation rates. It is argued that even with risk neutrality, Fisher's definition of the real rate is not the appropriate concept upon which to base economic decisions if inflation uncertainty is present. The appropriate concept is an expected real rate that involves an adjustment for uncertainty. Moreover, if the world is risk averse, the expected real rate is not a relevant concept for economic decisions.

The Production and Cost of Ambulatory Medical Care in Community Health Centers

Fred Goldman and **Michael Grossman**
Working Paper No. 907
June 1982
JEL No. 913

An assessment of the efficiency of federally funded community health centers (CHCs) in delivering ambulatory medical care to poor people reveals that the centers' input decisions do not always minimize costs. In particular, CHCs employ too few aides for physicians (nurses and physician assistants) and too many medical support and ancillary personnel relative to primary-care physicians. The CHC systemwide cost reduction produced by eliminating allocative inefficiency is estimated at $32 million in 1978 dollars, or 6 percent of total cost. This modest cost reduction, and evidence that allocative inefficiency is not more widespread among CHCs than among private-sector physicians, evoke serious questions about the conventional wisdom that services in the public sector are produced less efficiently than in the private sector. There is also support for the hypothesis that, since grants are not tied to particular services rendered, centers that derive most of their revenue from grants relative to Medicaid and private insurance have a greater incentive to provide a given mix of services in the least-cost method.

Who Does R and D and Who Patents?

Bronwyn H. Hall et al.
Working Paper No. 908
June 1982
JEL No. 620

This paper describes the construction of a large panel data set covering about 2600 firms in the U.S. manufacturing sector for up to twenty years. Included are annual data on financial variables, employment, R and D expenditures, and aggregate patent applications. This data set is to be used in a larger study of R and D, inventive output, and technological change.

In the present paper we present preliminary results on the R and D and patenting behavior of the 1976 cross-section of these firms. We find an elasticity of R and D with respect to sales of close to unity, with both very small and very large firms being more R and D-intensive than average. Because only 60 percent of the firms report R and D expenditures, we attempt to correct for selectivity bias. We find that, although the correction is small, it increases the estimated complementarity between capital intensity and R and D intensity.

In exploring the relationship of the patenting activity of these firms to their contemporaneous R and D expenditures, we look with some care at the choice of econometric specification; the discrete nature of the patents variable for our smaller firms may cause difficulties with the conventional log linear model. The choice of specification does indeed make a difference, and the negative binomial model, which is a Poisson-type model with a disturbance, is preferred. Substantively, we find a much larger output of patents per R and D dollar for the small firms, with a decreasing propensity to patent with size of R and D programs throughout the sample. However, this conclusion is highly tentative, both because of its sensitivity to specification and choice of sample and because we expect that the errors-in-variables bias resulting from our focus on R and D and patent applications in a single year is far worse for the small firms.

Exchange-Rate Policy after a Decade of "Floating"

William H. Branson
Working Paper No. 909
June 1982
JEL No. 431

In this paper I integrate exchange-rate policy into a model of exchange-rate behavior and econometrically examine the data to infer hypotheses about policy behavior in the 1970s. The model shows how unanticipated movements in money, the current account, and relative price levels will first cause a jump in the exchange rate, and then a movement along a "saddle path" to the new long-run equilibrium. Here the role of "news" in moving the exchange rate is clear. The model is used to analyze the options available to the central bank that wants to reduce the jump in the exchange rate following a real or monetary disturbance. The distinction is made between monetary policy and sterilized intervention, and a regime in which the domestic interest rate is used as the policy variable is also studied. Systems of vector autoregressions (VARs) for each of four countries—the United States, the United Kingdom, Germany, and Japan—are estimated, and the correlations among their residuals are studied. These represent the "innovations," or "news"

in the time series. A clear pattern emerges in these correlations, in which policy in the United States, and to a lesser extent Japan, drives exchange rates, and policy in Germany and the United Kingdom reacts. It appears that U.S. monetary policy is essentially determined by domestic considerations, with the exchange rate moving as a consequence. In Japan, interest rates are varied in response to movement in the current-account and relative price levels, and the effects on the exchange rate are partially neutralized by sterilized intervention. Germany and the United Kingdom react to movements in their exchange rates by moving interest rates and by sterilized intervention.

On Consumption-Indexed Public Pension Plans

Robert C. Merton
Working Paper No. 910
June 1982
JEL Nos. 521, 915

Using the known result that life-cycle investors optimally will hold portfolios whose returns are perfectly correlated with aggregate consumption, this paper uses a simple, intertemporal general equilibrium model to explore the merits and feasibility of pension plans where both accumulations and benefits are linked to aggregate per capita consumption. Although the analysis is made within the framework of a public pension plan, it applies equally well to organized private pension plans where participation is virtually mandatory and where individually designed programs are not practical. An additional feature of the plans examined is that they provide for life annuities during both the accumulation and the retirement phases of the life cycle.

A Comparison of Methodologies in Empirical General Equilibrium Models of Taxation

Don Fullerton, Yolanda K. Henderson,
and **John B. Shoven**
Working Paper No. 911
June 1982
JEL No. 323

Computational general equilibrium models have proven useful in the long-run analysis of alternative tax policies, such as a value-added tax, corporate and personal

income tax integration, a consumption or expenditure tax, housing subsidies, and inflation indexation. This paper reviews the methodologies used in the various models. We focus on eight specific models and review in turn: levels of disaggregation, specification of the foreign sector, financial modeling, the measurement of effective tax rates, heterogeneity and imperfect mobility, factor supply, treatment of the government budget, and technical issues associated with implementation.

The paper also includes some new experiments regarding integration of the personal and corporate income tax systems in the United States. We compare the welfare gains resulting from models with different levels of disaggregation, and we discuss alternative justifications for specific disaggregations. We also examine the sensitivity of the results to alternative specifications of households' endowments of labor and leisure.

Our analysis underscores the importance of the assumed elasticities of labor supply with respect to the net-of-tax wage, and of saving with respect to the net-of-tax rate of return. Unfortunately, these are also parameters for which there is not a consensus in the economics profession. We find that several aspects of modeling are especially ripe for further progress: the roles of government and business financial decisions, the dynamics of a life-cycle approach, and the measurement of incentive tax and transfer rates.

restrictive to assert that there exists a time-invariant latent variable c, such that x is strictly exogenous, conditional on c. A restriction of this sort is necessary to justify standard techniques for controlling for unobserved individual effects. There is a parallel analysis for multivariate probit models, but now the distributional assumption for the individual effects is restrictive. This restriction can be avoided by using a conditional likelihood analysis in a logit model.

Some of these ideas are illustrated by estimating union wage effects for a sample of young men in the National Longitudinal Survey. The results indicate that the lags and leads could have been generated just by an unobserved individual effect, which gives some support for analysis of covariance-type estimates. These estimates indicate a substantial omitted-variable bias. I also present estimates of a model of female labor force participation, focusing on the relationship between participation and fertility. Unlike the wage example, there is evidence against conditional strict exogeneity; if this evidence is ignored, the probit and logit approaches give conflicting results.

Optimal Control of the Money Supply

Robert B. Litterman
Working Paper No. 912
June 1982

Using optimal control theory and a vector autoregressive representation of the relationship between money and interest rates, one can derive a feedback control procedure defining the best possible trade-off between interest rate volatility and money supply fluctuations—a procedure capable of reducing both from their current levels.

Panel Data

Gary Chamberlain
Working Paper No. 913
June 1982
JEL Nos. 211, 824

In this paper, I consider linear predictor definitions of noncausality or strict exogeneity. I then show that it is

The Economic Status of the Elderly

Michael D. Hurd and **John B. Shoven**
Working Paper No. 914
June 1982

In the first part of this paper, we estimate the real income of the elderly and of the rest of the population during the 1970s. We find that income per elderly household has increased more rapidly than income per nonelderly household, even though the elderly's fraction of income from work has decreased greatly.

In the balance of the paper, we use the 1969 and 1975 Retirement History Surveys to estimate income, wealth, and inflation vulnerability of households whose heads were ages 58 through 63 in 1969. The results of the first section of the paper are verified. The 1969 data on wealth show that a representative person on the eve of retirement had small holdings of financial assets: mostly in housing, Social Security, and Medicare. Between 1969 and 1975 real wealth on average increased slightly, and there was some tendency for the distribution to tighten. We find that, contrary to popular opinion, on average the elderly are not especially vulnerable to a sudden increase either in prices or in the rate of inflation, since most of their assets are protected against inflation.

Interest Rate Volatility and Monetary Policy

Carl E. Walsh
Working Paper No. 915
June 1982
JEL No. 311

In October 1979 the Federal Reserve shifted from an interest-rate-oriented to a reserves-oriented operating procedure. It is argued in this paper that part of the very large increase in interest rate volatility that resulted from the policy switch may have been caused by shifts in the parameters of the money demand equation, shifts resulting from the adoption of a reserve aggregates operating procedure. This result is derived by comparing rational expectations equilibriums in a simple theoretical model under alternative policy rules. This allows the variance of interest rates to be explicitly expressed as a function of the policy rule.

Productivity Growth and R and D at the Business Level: Results from the PIMS Data Base

Kim B. Clark and **Zvi Griliches**
Working Paper No. 916
June 1982

This paper presents the results of a study on the relationship between productivity growth and R and D in the 1970s. Using data on narrowly defined "business units" within a firm, we develop a series of estimates under different assumptions about technology, industry effects, and changes in the return to R and D over time. The R and D data are broken down into process and product expenditures, and some information is available on past success in developing proprietary technology and on the incidence of major changes in technology in the recent past.

Our results suggest a significant relationship between R and D and the growth of productivity; in versions using total factor productivity as the dependent variable, the estimated rate of return to R and D investment is about 20 percent. We find some evidence that R and D has its biggest effect on productivity in those markets where major changes in technology have occurred in the recent past. Previous success in developing proprietary process technology affects total factor productivity directly but appears to have little effect on estimated returns to R and D. The notion that the productivity of R and D declined in the 1970s finds little support in this data. Irrespective of model specification, trends in the R and D coefficient are substantively and statistically insignificant. Our calculations suggest that reduced investment in R and D may have accounted for at least 10 percent of the decline in total factor productivity growth in the 1970s.

Federal Reserve Policy, Interest Rate Volatility, and the U.S. Capital-Raising Mechanism

Benjamin M. Friedman
Working Paper No. 917
June 1982
JEL No. 311

The evidence presented in this paper leads to three conclusions about how the U.S. long-term capital-raising mechanism may be affected by the sharp increase in interest rate volatility that has followed the Federal Reserve System's adoption of new monetary policy procedures in 1979:

(1) Nonfinancial corporations have probably been led to finance less of their external funds requirements at long term than they would otherwise have done.

(2) Underwriters of high-grade corporate bonds have probably been led to increase the spread of the yield of a typical new issue over the prevailing market yield on comparable bonds already outstanding.

(3) There is little firm basis (reported here, anyway) to conclude that the increased volatility in particular has affected investors' portfolio behavior in the bond market.

The Economics of Mortgage Terminations: Implications for Mortgage Lenders and Mortgage Terms

Patric H. Hendershott, Sheng Cheng Hu,
and **Kevin E. Villani**
Working Paper No. 918
June 1982
JEL No. 313

This paper begins with the development of models that explain the mortgage refinancing and assumption decisions of households. Having identified the economic variables influencing these decisions, we then simulate the models for different values to determine under what conditions households will refinance or assume. Finally, we draw some implications of these results for: (1) the impact of a decline in mortgage rates on the asset portfolio yields of mortgage lending institutions; and (2) the effect of the observed rise in interest rate volatility, including the optimal terminations response of mortgage borrowers, on the terms of the mortgage contract and the returns to mortgage lenders on recently issued mortgage loans.

Domestic Tax Policy and the Foreign Sector: The Importance of Alternative Foreign Sector Formulations to Results from a General Equilibrium Tax Analysis Model

Lawrence H. Goulder, John B. Shoven, and **John Whalley**
Working Paper No. 919
June 1982

There is a growing recognition among public finance economists of the inappropriateness of closed economy models for analyzing alternative U.S. tax policies. In response to this, our paper reports on four different specifications of an external sector for the Fullerton-Shoven-Whalley general equilibrium tax model of the United States. The alternative formulations permit an assessment of their impact on the findings of the model and provide the enhanced capability for analysis of tax policies that are closely related to foreign trade issues (such as a VAT).

The results indicate that the different formulations of an external sector can substantially affect the findings of the model. When the model permits international capital flows, the effect of a tax policy can be quite different from that predicted by a closed economy model. Capital mobility substantially increases the efficiency gain implied by corporate tax integration, while it more than eliminates the efficiency advantage of moving from an income tax to a consumption tax (unless adjustments are made in the foreign tax credit). The sensitivity of the evaluation of the efficiency of domestic tax policies to the functioning of international capital markets suggests the need for further research to determine precisely how those markets operate.

Unemployment Insurance and Labor Force Transitions

Kim B. Clark and **Lawrence H. Summers**
Working Paper No. 920
June 1982

This paper reports preliminary estimates of an econometric simulation model capable of a comprehensive evaluation of the effects of unemployment insurance (UI) on measured and actual employment, unemployment, and nonparticipation. The data are longitudinal, comprising information on 75,000 households sampled in the Current Population Surveys of March and April 1978. The simulation model is constructed from multinomial logit equations characterizing individuals' labor force transitions. These equations provide estimates of the effects of UI on job loss, labor force exit, and entry into the labor force, as well as the effect of UI on unemployment duration and temporary layoffs. The results are rather inconclusive but suggest the importance of further research on UI and transitions in and out of the labor force.

International Interest-Rate and Price-Level Linkages under Flexible Exchange Rates: A Review of Recent Evidence

Robert E. Cumby and **Maurice Obstfeld**
Working Paper No. 921
June 1982
JEL No. 431

In an open economy, the scope for activist stabilization policy depends on the nature of the linkages between domestic and international markets for goods and assets. Two important relationships—purchasing power parity and uncovered interest-rate parity—have received extensive empirical attention in recent years and are fundamental building blocks of several empirical exchange-rate models. This paper reviews and extends recent econometric findings on these two classical parity relationships and on their corollary, the international equality of expected real interest rates.

Econometric tests assuming rationality of expectations are on the whole unfavorable to the classical parity relationships: with few exceptions, they are strongly rejected. A central theme in the review of empirical work is the conditional heteroskedasticity of inflation and exchange-rate forecast errors and the bias this statistical problem may impart to tests of international parity relationships. The paper proposes and implements a test for conditional heteroskedasticity that in many cases produces strong evidence that the problem is indeed important.

Investment for the Short and the Long Term

Stanley Fischer
Working Paper No. 922
June 1982

If asset returns have different dynamics, then their short- and long-run risk characteristics must differ. For instance, if returns on one asset follow a random walk, then the asset is very risky to hold for the long term even if it is quite safe for the short term. This paper examines

the effects of the different dynamics of asset returns on optimal portfolio behavior, for portfolios held for differing lengths of times. It then examines the evidence on the dynamics of stock and bill returns in the United States. The evidence shows that bill returns are more serially correlated than stock returns. Thus, the longer bills are held, the more their riskiness, relative to that of stocks, rises. Optimal portfolios are simulated, and it is shown that optimal portfolio proportions are not very sensitive to the length of the holding period of the portfolio.

Who Owns the Assets in a Defined Benefit Pension Plan?

Jeremy I. Bulow and **Myron S. Scholes**
Working Paper No. 924
July 1982

In a defined benefit pension plan, the employer's liability to employees is the present value of vested benefits: those benefits that employees would receive if the pension plan were immediately terminated. This literal and simple definition of the employer's liability helps one to understand the economics of the promise of a pension, but several common provisions of pension plans require an expanded definition. Anomalies such as vesting, early retirement benefits, lump sum provisions, and ad hoc increases in benefits for retired employees indicate that employees accrue benefits in excess of those promised upon termination of the plan. These anomalies, however, can be explained by assuming that employees as a group possess specific human capital. Although losing one, or a few employees, from the group would be a small loss, losing the entire group would be a great loss. In this model, employees bargain with the stockholders over the compensation of the entire group; they allocate their compensation according to marginal product, returns from previous equity investments in the human capital of the group, and purchases and sales of claims on this capital. The model explains the anomalies as a natural outgrowth of the transactions of members within the group. In addition, the model explains the use of defined benefit pension plans and how employees could have claims, in excess of vested benefits, on the assets in the pension plan.

Trade Structure and Transmission of Inflation: Theory and Japanese Experience

Jongmoo Jay Choi and **M. Ishaq Nadiri**
Working Paper No. 923
June 1982
JEL No. 430

The international price linkage in a model with a single

commodity can be explained trivially by the law of one price or by the quantity theory of money. In this paper, we formulate a simple, sectoral general equilibrium model with money. The transmission of price pressures from the world market to nontradable sectors of a domestic economy depends on: (1) industry structure; (2) the size of the direct price-substitution effect; and (3) the indirect money-and-income effect, through the balance of payments. We empirically implement our structural model for Japan, 1956–77; the various dynamic simulations that we conduct show both the overall magnitude of imported inflation and the relative importance of three major channels of transmission (price, money, and income) of Japanese inflation during the period covered. These results imply that the closing of one channel of transmission, such as the monetary channel, by a completely sterilizing monetary policy does not insulate the domestic economy from foreign price disturbances.

LDC Borrowing with Default Risk

Daniel Cohen and **Jeffrey Sachs**
Working Paper No. 925
July 1982
JEL Nos. 431, 441

This paper presents a theoretical model that describes the effects of default risk on international lending to LDC sovereign borrowers. The threat of defaults in international lending is shown to give rise to many characteristics of the syndicated loan market: (1) quantity rationing of loans; (2) LDC policies designed to enhance creditworthiness; (3) prevalence of short maturities on international loans; and (4) a prevalence of bank lending relative to bond-market lending.

Effects of U.S. Monetary Restraint on the DM/Dollar Exchange Rate and the German Economy

Jacques R. Artus
Working Paper No. 926
July 1982

This paper assesses the quantitative effects of a shift to monetary restraint in the United States on the DM/dollar exchange rate and the German economy. The results indicate that such effects are large. If Germany keeps its money growth unchanged, it will tend to experience a sharp and sustained depreciation of the Deutschemark and a significant increase in inflation and unemployment. If it adopts an equivalent policy of monetary restraint, it will tend to benefit from a marked decline in inflation, but the cost in terms of lost output will be extremely large.

Economic Implications of ERISA

Jeremy I. Bulow, Myron S. Scholes, and **Peter Menell**
Working Paper No. 927
July 1982

If the intent of the Employee Retirement Income Security Act (ERISA) was to assure that beneficiaries of insolvent pension plans would receive adequate pension benefits, then sharp increases in nominal rates of interest have blunted that purpose. Even without an increase in these nominal rates, the Pension Benefit Guarantee Corporation (PBGC), the insurance agency established to guarantee benefits, would face large liabilities on the terminations of pension plans.

We examine the economics of pension plans and their funding before and after the enactment of ERISA. The PBGC, the employer, and the employees all have interests in the assets of the pension plan. The PBGC can tax corporations to pay off liabilities and to fund guaranteed benefits; employers can terminate pension plans or overfund them; employees can ask for more benefits or claim the assets in the fund. Although the PBGC insures benefits, it does not act or react quickly to protect its own interests. However, to prevent potential huge increases in its liabilities, the PBGC can require that employers hedge the guaranteed benefits, or that employers more fully fund their increases in promised benefits.

Public Policy and Employment Discrimination in the United States

Richard B. Freeman
Working Paper No. 928
July 1982
JEL NO. 820

This paper examines evidence on employment practices in the United States with respect to race, and the impact of governmental antibias activity on these practices. It shows a striking difference in the responses of American and British employers to job applications of members of different races and asks whether these differences in response can be attributed to the greater U.S. effort to aid minority workers. It also reviews the recent research by Jonathan Leonard on the effect of court suits and affirmative action compliance activity and concludes that much of the improved status of minorities in the United States is indeed due to governmental activity and public policy.

Taxes and the User Cost of Capital for Owner-Occupied Housing

Patric H. Hendershott and **Joel Slemrod**
Working Paper No. 929
July 1982
JEL Nos. 323, 932

Owner-occupied housing is favored in the tax code since mortgage interest and property taxes can be deducted in the computation of one's income tax base, while the returns from owner-occupied housing are not taxed. This special tax treatment reduces the user cost of capital for owner-occupied housing.

This paper focuses on the measurement of the tax rate to be employed in the user cost calculations. We argue that different tax rates are appropriate for the tenure choice and quantity-demanded decisions, and that the values depend on the detailed tax position of the household and the method of finance. We calculate average 1977 tax rates for households in different income ranges using the NBER TAXSIM microeconomic data file on individual tax returns.

Consumption during Retirement: The Missing Link in the Life Cycle

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Working Paper No. 930
July 1982

This study presents the first evidence on the relation of consumption to lifetime wealth, based on data from the 1973 and 1975 Retirement History Survey linked with records of Social Security earnings. Nearly 500 white, married, fully retired couples, ages 62–69, form the basis of the analysis. On average their consumption early in retirement is 14 percent greater than the income that their financial, pension, and Social Security wealth can generate. This implies that their saving, both private and through Social Security, is insufficient to sustain consumption throughout the rest of their lives. Additional evidence, based on changes in spending between 1973 and 1975, shows that these households respond by reducing their real consumption at a rate sufficient to generate positive changes in their net financial worth within a few years after retirement. These two pieces of evidence can be rationalized by a rate of time preference much higher than the interest rate, coupled with either a bequest motive or uncertainty about the length of life. The evidence also implies that, even when combined with private pensions and savings, Social Security in the United States today does not enable most recipients to maintain their living standard at the levels they enjoyed before they retired.

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