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NBER Reporter

NATIONAL BUREAU OF ECONOMIC RESEARCH, INC. SPRING 1981

Program Report

International Studies

William H. Branson

The research in NBER's Program in International Studies falls into three major categories: exchange rates, comparative macroeconomics, and long-run structural changes in the world economy. This third area, the most recent addition to the program, pulls together the long-run aspects of exchange rates and comparative macroeconomics but also focuses on questions of comparative productivity growth among countries, international changes in the location of manufacturing, and patterns of trade. Each of the areas of research is summarized briefly below.

Exchange Rates

The first concern undertaken by NBER's Program in International Studies was exchange rates. More specifically, the focus has been on short-run determinants of nominal exchange rates, longer-run movements in real exchange rates, and the role of exchange rates in macroeconomic policy. Members of this project meet periodically, usually in New York, to discuss their work.* Project members also gathered in Cambridge last summer (1980) for a month-long presentation of workshops and seminars.

Incorporating the feedback from those sessions, Willem H. Buiter and Douglas D. Purvis produced Working Paper No. 592, "Oil, Disinflation, and Export Competitiveness: A Model of the 'Dutch Disease.'" Maurice Obstfeld has recently investigated related work on the appropriate rates of exchange for macroeconomic policy (Working Paper No. 599, "Macroeconomic Policy, Exchange Rate Dynamics, and Optimal Asset Accumulation").

Research associates John Bilson and Richard Marston are currently organizing a two-part conference on exchange rates. The first session, scheduled for January 1982, will be a technical, working meeting designed for interested economists and aimed at consolidating existing and ongoing research. A second meeting, where completed work will be presented to those interested in exchange rate policy, is set for summer 1982.

For a discussion of the project's most recent meeting, see the "Bureau News" section of this issue of the Reporter.

In This Issue

Program Report: International Studies 1
Research Summaries
Government Purchases, Public Debt, and Taxes 2
The Costs of Inflation 5
Trade and Employment in Developing Countries 7
Economic Outlook Survey 9
NBER Profiles 10
Conferences 13
Conference Calendar 18
Bureau News 19
Current Working Papers 27

This issue of the *Reporter* highlights the Bureau's Program in International Studies. Next, Robert Barro discusses his work on governmental macroeconomic policies; Stanley Fischer writes about the costs of inflation; and Anne Krueger describes some of her recent work on developing countries. 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. This latter section contains an analysis of the 1980 recession written by Victor Zarnowitz and Geoffrey Moore. The *Reporter* concludes with short summaries of recent NBER Working Papers.

Comparative Macroeconomics

About half the international studies portion of NBER's 1981 Summer Institute will be devoted to topics in comparative macroeconomics. Several research associates are working on problems in this area, including Paul Krugman (see Working Paper No. 554, "Oil and the Dollar"). Faculty Research Fellow Jeffrey Sachs has investigated related work, including Working Paper No. 582, "Energy and Growth under Flexible Exchange Rates: A Simulation Study." The focus of such research is on how different structures among the industrialized economies

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influence (1) the economies' reactions to external shocks such as rising oil prices and (2) the transmission of disturbances among countries as through fluctuations in exchange rates. A natural extension of this research will be the design of optimal macroeconomic structures.

Long-Run Structural Change

During the 1979 Summer Institute, NBER researchers expressed a common interest in the problems of trade and long-run structural change in the world economy. The rise of new industrial centers and the competitive challenge they pose to U.S. industry were discussed in my chapter, "Trends in U.S. Trade and Investment since World War II," in *The American Economy in Transition*, Martin Feldstein (ed.), (Chicago, 1980), a recent NBER conference volume. The response of both the U.S. economy and U.S. policy to these challenges will be one of the main problems for industrial policy in the coming years. Several NBER research associates are working on topics that have direct bearing on this subject: for example, Ray C. Fair and Dennis Warner are building models to describe the structural changes, and Irving B. Kravis and Robert E. Lipsey have described "The Location of Overseas Production and Production for Export by U.S. Multinational Firms" in Working Paper No. 482.

A separate group has been organized, with J. David Richardson as chairman, to develop a unified NBER project in this area. Several meetings of the group have already been held in Cambridge, and its work will be another focal point for the 1981 Summer Institute.

Research Summaries

Government Purchases, Public Debt, and Taxes

Robert J. Barro

Although the "equilibrium approach to macroeconomics" has become identified with monetary models of business fluctuations, this general theoretical viewpoint has also been applied to other aspects of aggregative analysis. The research described here involves macroeconomic effects of government purchases, public debt, and taxes.

Government Purchases

The output and real rate-of-return effects of government purchases mainly depend on the size of current purchases relative to their anticipated long-run average level.[1] A permanent increase in the flow of government purchases implies—regardless of the current method of finance—a parallel decline in the long-run average of

[1] *R. Barro, "Output Effects of Government Purchases," NBER Working Paper No. 432, January 1980, and forthcoming in* Journal of Political Economy.

disposable real income. Since private commodity demand would decline roughly one-to-one, there is little net impact on current aggregate demand. Therefore, on this ground, only minor changes would occur in the equilibrium values of real interest rates and aggregate output.

The same viewpoint implies only a small negative reaction of private demand when the rise in government purchases is perceived as temporary. War spending is a prime example. The substantial increase in current aggregate demand induces a rise in the equilibrium real rate of return. On the supply side, this rise signals unusually high rewards to current work and production. The intertemporal substitution of effort toward such periods implies an expansion of total current output. Therefore, temporary government purchases tend to raise aggregate output and the real interest rate. However, the response of total output is less than one-to-one with the rise in government purchases—that is, the model predicts a dampener rather than a multiplier effect.

The macroeconomic effects of government purchases also depend on their substitutability with private consumption and investment spending. This consideration implies that government purchases directly crowd out some amount of private demand. Hence, the aggregate demand effect of temporary government purchases is lessened; the output and real rate-of-return responses are reduced correspondingly.

Another effect involves the role of public services as an input to private production processes. Assuming that public services have positive marginal product, this channel raises the aggregate output effects of permanent and temporary increases in government purchases. (Part of the response in measured real GNP involves the double counting of government-provided intermediate goods in the computation of final product.)

Finally, the macroanalysis must also incorporate the disincentive effects that result from higher tax rates. As discussed below, higher tax rates would accompany permanent expansions in government spending—temporary movements mainly would be deficit financed. Higher tax rates deter work effort and investment, which introduces a negative effect on aggregate output. On the other hand, since a larger government sector can make people poorer in the aggregate, a negative income effect could arise which would spur greater work effort.

On net, the output effects of permanent changes in government purchases are ambiguous. The major theoretical conclusion is the positive effect on output of the real rate of return from temporary expansions of government purchases.

Some empirical analysis of U.S. output determination has focused on the distinction between permanent and temporary changes in government purchases. The only temporary movements that have been isolated concern war-related shifts in defense spending. Other changes in the ratio of government purchases to GNP appear to be permanent. Analysis of real GNP indicates nearly a one-to-one effect from a temporary rise in defense spending. Permanent rises in defense spending also show a significantly positive influence on output, but—in accordance with macroeconomic theory—the estimated effect was significantly below (and about half the size) of that for temporary increases. Since no temporary shifts in federal plus state and local nondefense purchases were isolated, the output effects from this category could not be ascertained empirically. The coefficient associated with permanent shifts in nondefense purchases was imprecisely determined. Essentially, the principal action in government purchases since 1940 has been in the defense component. (Therefore, any serious analysis of the effects of government purchases on output over this period must attempt to deal with the nature of military spending.) Finally, the empirical results were also in accord with some detailed expectational hypotheses that concern coefficient restrictions across the equations that determine real GNP and real defense purchases.

Another study investigated the impact of the same government purchases variables on realized real rates of return to equities and Treasury bills.[2] Temporary defense spending had a significantly positive influence on the total real returns to New York Stock Exchange issues. There was a suggestion of a positive effect for Treasury bills, but the estimated coefficients were not statistically significant. Permanent defense and nondefense purchases played no significant role. Overall, this evidence provides some weak support for the theory, which predicts a positive real rate-of-return-effect from temporary purchases and a minor effect (of indeterminate sign) for permanent purchases.

Public Debt

Since the work of David Ricardo, economists have been concerned with the implications of financing government expenditure via interest-bearing debt rather than taxation. Assume a given time path of government expenditure for purchases of goods and services and for transfer payments. Shifts between current taxes and debt issue mainly involve a rearrangement of the timing of levies with no change in the present value of tax liabilities. (Revenue from money creation is treated as one form of tax.) Accordingly, the tax/deficit mix should have no first-order impact on aggregate demand. With no shift here, there are also no effects of the deficit on the equilibrium values of (real and nominal) interest rates,

[2] *R. Barro, "Intertemporal Substitution and the Business Cycle," NBER Working Paper No. 490, June 1980, and forthcoming in* Carnegie-Rochester Conference Series on Public Policy.

CORRECTION

In the last issue of the *NBER Reporter*, in figure 1 of the research summary, "Quantitative Studies of the Business Cycle" by Christopher A. Sims, the labels on the lines denoted CRP and M1 were inadvertently transposed. Thus, the remark in the note, "The model clearly attributes most actual variation in IP to shocks in IP itself and in CRP over this period," is correct, contrary to the impression given by the mislabeled figure.

the general price level, output, investment, and so on.[3] My recent analyses consider the implications—none of which seems to upset the principal conclusions—of finite lifetimes, imperfect private capital markets, uncertainty about future incomes or tax shares, interactions with the determination of the volume of government expenditure, and so on. The analysis is shown to pertain also to an unfunded social security system. Shifts in the scale of this program have no first-order impact on aggregate demand, which implies no first-order effects on the equilibrium values of capital accumulation, interest rates, and the like. Offsetting private intergenerational transfers are the vehicle that tends to neutralize the publicly mandated transfers that are implied by Social Security.

Deficits and the Timing of Taxes

Since deficits alter the timing of tax collections, it is natural to analyze the (second-order) real effects of the debt/tax choice from the viewpoint of public finance theory. The intertemporal pattern of tax rates is set to minimize the overall expected deadweight loss implied by financing a given present value of government expenditures. Under some circumstances this criterion dictates constant expected tax rates over time. That is, tax rates are fixed to smooth out any predictable variations in the ratio of government expenditures to national income. Heuristically, the case for intertemporal uniformity of tax rates—say, on factor incomes—emerges if the (own- and cross-) responsiveness of factor supplies to aftertax rewards is similar at different dates. For example, the Ramsey-like rule for taxation in inverse relation to own-supply elasticities yields this answer in the context of a uniform intertemporal pattern of elasticities. More generally, the timing of tax rates could depend on interactions of each period's supply/demand behavior with the state of the business cycle, the level of government expenditure, and so on. The signs or magnitudes of these effects are not apparent on theoretical grounds.

I have carried out some empirical analyses based on two tentative theoretical ideas: first, the criterion of constant expected overall tax rates provides an approximate guide to optimal public finance; and second, this proposition constitutes a positive theory of government behavior. The properties of public debt and tax collections over time have been examined to test whether actual behavior departs in important ways from that dictated by this simple rule for intertemporal public finance.

The stabilization of anticipated tax rates over time has a large number of implications for public debt behavior, some of which are familiar from alternative perspectives and some of which are new. These implications include the following:

(1) Temporarily large government expenditures (such as war spending, large capital projects, and international reparations payments) would be financed primarily by debt issue. Major increases in current tax rates would be inconsistent with the expectation of reduced government spending in future periods.

(2) Expansions of government's share of GNP that are perceived as permanent would be met by parallel increases in current and expected future tax rates.

(3) If real government expenditures exhibit little cyclical variability, a tax smoothing policy entails deficit finance during recessions and surpluses during booms.

(4) The policy of maintaining stable tax rates over time is independent of the initial stock of outstanding public debt. Therefore, exogenous changes in the real debt stock (produced, for example, by monetary-induced unexpected inflation) would leave unchanged the subsequent growth rate of the debt.

(5) An unanticipated increment in unfunded future liabilities (such as planned Social Security benefits) raises the long-run real government spending flow and therefore current taxes by the product of the real interest rate and the real present value of the future liability. There is a corresponding shift toward a surplus position in the current government budget, defined to exclude the unfunded liabilities. That is, if other components of anticipated government spending are held fixed and no portions of the unfunded liability are paid off currently, the funded debt would decline in the present period by the product of the real interest rate and the change in the capitalized value of the unfunded debt. This behavior implies that movements in funded debt exactly offset *predictable* changes in unfunded debt.[4]

(6) Anticipated (exogenous) inflation has a one-to-one effect on the growth rate of nominal debt. A divergence between the debt growth rate and the expected inflation rate implies systematic movements in the stock of real debt and hence in real interest payments, which would be inconsistent with the policy of smoothing tax rates over time.

I have tested these and other theoretical propositions by using the time-series data on U.S.-funded public debt since World War I.[5] The results are basically consistent with the theory. In particular, the principal movements in the public debt growth rate since the 1920s are explained by shifts in three variables: (1) temporary movements in federal spending (which captures the important influence of wartime finance), (2) output fluctuations (which induce a strong—possibly excessive from the standpoint of the theory—countercyclical response of the federal deficit), and (3) the expected rate of inflation. The last variable accounts for the bulk of reported federal deficits in recent years. These deficits are primarily an artifact of

[3] *R. Barro, "Are Government Bonds Net Wealth?"* Journal of Political Economy, *November/December 1974; "Reply to Feldstein and Buchanan,"* Journal of Political Economy, *April 1976; "Public Debt and Taxes," in M. Boskin (ed.),* Federal Tax Reform, *Institute for Contemporary Studies, 1978; "Comment from an Unreconstructed Ricardian,"* Journal of Monetary Economics, *August 1978; "Federal Deficit Policy and the Effects of Public Debt Shocks," NBER Working Paper No. 443, February 1980, and* Money, Credit and Banking, *November 1980.*

[4] *I have not yet attempted to test this proposition empirically. The test is difficult because the determinant of current tax rates is expected future total spending—Social Security benefits or other unfunded obligations play no special role here.*

[5] *R. Barro, "On the Determination of the Public Debt,"* Journal of Political Economy, *October 1979.*

an accounting system unsuited to an inflationary environment—most of the deficit would disappear if it were measured appropriately as the change in real (funded) public debt.

Tax Rate Changes over Time

The underlying tax rate smoothing theory implies that future changes in (overall) tax rates would be unpredictable based on currently available information. This proposition has been tested directly by examining the behavior of U.S. federal and total government tax (and so-called nontax) receipts relative to GNP.[6] These variables are used as proxies for the tax rate concepts that appear in the theory. The sample for the federal government goes back to 1879, while that for total government starts in 1929.

The main empirical results accord with the theory in the following respects: (1) there is little indication of drift in the tax ratios; (2) there are only insignificant relations of tax rate changes to the own history of changes; and (3) there is little explanatory value for tax rate changes from a vector of lagged variables, which include the behavior of government spending and aggregate output. In some cases, especially over the longer samples, significant relations were found when a government spending ratio was substituted as the dependent variable for the corresponding tax ratio. Hence, the empirical procedure was capable of isolating predictable tax rate movements that mimicked the predictable changes in the spending ratios. Movements in the tax ratios were shown also to be less volatile than the changes in the corresponding spending ratios, which is an additional prediction of the tax rate smoothing model.

From the viewpoint of intertemporal substitution effects, the important relation concerns current tax rates relative to anticipated future rates. For example, an expectation of rising tax rates on labor earnings would generate a positive substitution effect on current labor supply. Similarly, anticipations about future changes in the investment tax credit have been emphasized as a source of intertemporal substitution effects on investment demand. The statistical analysis described above was incapable of detecting situations where current overall tax rates for the federal or total government sector were temporarily significantly above or below their long-run expected values. If this finding is sustained in more general circumstances, it suggests that existing aggregate time-series observations will not be useful in assessing how responsive the economy would be to overall tax rates that are perceived as temporarily high or low. The necessary experiment seems not to have been carried out. Policies that involve intertemporal manipulation of aggregate tax rates probably cannot be evaluated with the available data.

[6]*R. Barro, "On the Predictability of Tax Rate Changes," NBER Working Paper No. 636, February 1981, abstracted in this issue of the* Reporter.

The Costs of Inflation

Stanley Fischer

With inflation as a prime concern of macroeconomic policy, it is important to identify the costs that inflation imposes on the economy, and to try to quantify those costs. There are three sources of inflationary costs in the U.S. economy. First, inflation makes it costly to hold money. Second, costs arise from the failure of institutions—particularly the tax system—to adapt to inflation. Third, there are a variety of costs arising from the empirical links among the rate of inflation, uncertainty about inflation, and the variability of relative prices.[1]

Let us begin by thinking about an economy in which inflation is proceeding at a steady and perfectly foreseen rate, and in which all possible adjustments for the existence of inflation have been made. All dollar amounts in contracts inherited from the past and in those specified for the future have been adjusted for inflation, perhaps, but not necessarily by formal indexation. All interest rates include a premium for expected inflation; the tax system taxes only real returns on assets; tax brackets are adjusted for bracket creep; and rental and labor contracts take inflation into account.

The only cost of inflation in an economy of this type arises from the implausibility of paying interest on currency. The owners of currency lose from inflation because the value of the currency falls as the price level rises. The inflation generates revenue for the government as currency holders acquire money to maintain constant the real value of currency holdings.

Inflation can be viewed in this context as a tax on the holdings of currency; the relevant question is whether the costs imposed by the inflation tax are smaller or larger than those of alternative taxes. The evidence is that the inflation tax on currency holdings is a relatively expensive way of raising revenue. Most of the $10 billion the federal government obtained from the issue of new currency in 1980 can be attributed to inflation. The excess burden of raising this revenue was about $5 billion in 1980; some of the burden was borne by foreigners who hold dollar bills, and some by those holding currency for financing illegal activities.

The almost perfect adaptation of institutions and contracts to inflation described above is of course a far cry from the reality of the U.S. economy. The major failures to adapt to inflation are in the financial and tax systems. For purposes of this section we continue to assume that inflation is perfectly foreseen by economic agents.

Interest rate controls set at levels inherited from the low inflation of the past impose costs on the holders of the corresponding assets, particularly zero interest-bearing deposits. The nonpayment of interest on bank reserves indirectly imposes a further cost on deposit

[1]*See F. Modigliani and S. Fischer, "Towards an Understanding of the Real Effects and Costs of Inflation," NBER Working Paper No. 303, November 1978; also S. Fischer, "Adapting to Inflation in the United States Economy," NBER Conference Paper No. 94, October 1980.*

holders. The existence of these controls has led to financial innovation, both in the form of new liabilities (such as the NOW account) of existing institutions, and through the creation of new institutions (for example, the money market funds). The financial innovations, together with the major reform of the monetary system embodied in the Depository Institutions Decontrol and Monetary Control Act of 1980 (which eliminates interest rate controls by 1986) will substantially reduce the costs of inflation that arise through the operation of the financial system. Continuing institutional change in this area makes it difficult to measure the costs of inflation arising from interest rate regulations.

The second major source of costs of inflation due to institutional nonadaptation is the tax system. Extensive research in this area has been undertaken at the NBER by Martin Feldstein and Lawrence Summers.[2] The major question is the effect of inflation on the real aftertax rate of return on investment received by the investor. Effective tax rates rise with the inflation rate in the current tax system primarily because depreciation allowances are based on historical cost, and also because firms inexplicably choose to pay higher taxes by using FIFO instead of LIFO inventory accounting. Some estimates are that under the current tax laws, an increase by 1 percentage point in the inflation rate increases the effective rate of taxation of the return on capital by about 2.5 percent under the current tax laws.

The costs of the increased taxation of capital associated with higher inflation depend in part on the effects of changes in the rate of return in promoting savings. Under reasonable assumptions, the welfare cost associated with the increased taxation of capital when the inflation rate is 10 percent rather than zero is about 0.7 percent of GNP, or nearly $20 billion per year.

Uncertainty about this estimate has two sources. First, there is uncertainty about the relevant economic parameters. Second, the tax system does adjust for the existence of inflation, albeit imperfectly and sporadically. Changes in tax rates and depreciation allowances can be viewed in part as a response to inflation, and thus a means of reducing the costs of inflation.

Further tax-related costs of inflation arise from the misallocation of capital among sectors that are taxed at different rates as a result of inflation. Since, under the current tax laws, housing fares better than corporate capital during rate rises in inflation, there is substitution of investment toward housing and away from corporate capital. Similarly, the expected life of capital equipment will adjust as the inflation rate rises.

The best known of the tax-inflation distortions is probably that of bracket creep: effective rates of income tax rise when the price level rises and nominal tax brackets are not adjusted. The economic costs of bracket creep would arise primarily from the effects of higher effective tax rates on labor supply, a topic on which little definitive is now known. Here too the costs of inflation have been reduced by periodic adjustments of tax brackets.

The costs of inflation associated with the failure to adjust the institutional structure of the economy are in some sense self-inflicted. The tax system could be indexed. Deregulation of the monetary system will indeed reduce the costs of inflation arising from distortions of the payments system. Such adjustments are not themselves cheap, in that they require complicated legislation and changes in conventional methods of thinking and accounting, but once in place they reduce the costs of ongoing inflation.

For precisely this reason, it is frequently argued that adjustment of the economy's institutions to make it easier to live with inflation should be avoided. The argument is that policymakers will find it easier to choose inflationary solutions to their problems if the costs of inflation are reduced. Arguments also presume that the total costs of inflation would be higher under such circumstances. Experiences of a large cross section of countries show that while those with high rates of inflation have adopted indexation of their tax systems, there is no strong evidence that indexing of taxes provides an independent stimulus to inflation.

The third type of cost of inflation arises from the relationships among the rate of inflation, uncertainty about inflation, and the variability of relative prices. High average rates of inflation tend also to be variable rates, although this is not an inevitable relationship. Table 1 shows, for instance, average annual rates of U.S. inflation and the variance of the inflation rate for the three decades 1950–79.

TABLE 1. The U.S. Rate of Inflation and Its Variability, 1950–79

	Average	Variance
1950–59	2.06	5.00
1960–69	2.33	2.01
1970–79	7.11	6.38

Note: Inflation rate is CPI, year over year.

Variable rates of inflation over the long term appear to be more uncertain rates of inflation, in two senses. First, individuals disagree more about what the inflation rate will be—this is reflected in expectations gathered in surveys. Second, each individual is probably less confident about his or her own prediction of inflation. Uncertainty about inflation imposes costs on individuals in the absence of a means of hedging that is free and works perfectly against the inflation. Such hedges do not exist in the U.S. economy. For the individual, housing appears to have been the best hedge. In terms of financial assets, work by Zvi Bodie indicates that the best way of hedging is by holding a portfolio heavily weighted with Treasury bills.[3] The difficulty of hedging is more acute for the long term, particularly given the recent performance of equity in the face of inflation. The uncertainty about inflation associated with higher inflation is also asserted to have an independent effect in reducing investment, although it has not so far been possible to distinguish the effects of uncertainty from those induced by tax changes.

[3] *Z. Bodie, "Purchasing Power Annuities: Financial Innovation for Stable Real Retirement Income in an Inflationary Environment," NBER Working Paper No. 442, February 1980.*

Recent evidence has also uncovered a very strong relationship between uncertainty about inflation and the rate of unemployment. The basis for this relationship has not been established, so that any attempt to assign the costs of higher unemployment to inflation are premature. Indeed, estimates of the costs of uncertain inflation in general are highly speculative.

Finally, high rates of inflation are associated with increased variability of relative prices. The relationship in the 1970s can be traced largely to the impact of changes in the price of energy on relative prices and subsequently on inflation. It is doubtful that such a relationship can be treated as a source of costs of inflation over and above those already mentioned.

In brief, some costs of inflation are inevitable but likely to be small; some costs that are large arise because institutions have not adapted to inflation and these institutions are difficult to change; and some costs, associated with uncertainty and relative price variability may well be large but require further research before they can be pinned down.

Trade and Employment in Developing Countries

Anne O. Krueger

In the years after World War II, the developing countries adopted highly restrictive trade and payments regimes, partly in the belief that these regimes would encourage industrialization through "import substitution." Behind high walls of tariff protection, import prohibition, and other measures that sharply separated the industrial sectors of the developing countries from the international economy, domestic industries producing the goods formerly imported sprang up. For a while, growth rates were fairly satisfactory but over time they diminished. By the late 1960s and early 1970s, disillusionment with the import-substitution strategy and its results was increasing. Contributing to this trend were both the results of research on the effects of the strategy (including the earlier National Bureau Project on Foreign Trade Strategies and Economic Development that Jagdish Bhagwati and I directed) and the remarkable increases in growth rates experienced by some of the countries that had shifted to an export-promotion strategy.

Simultaneous with that disillusionment, however, came a fundamental questioning of the adequacy of economic growth as an objective. Many observers began doubting the degree to which economic growth had resulted in increased employment opportunities and higher living standards for the majority within the developing countries; some asserted that switching away from import-substitution policies worsened the prospects for employment growth.

A fitting question, and the one the Project on Alternative Trade Strategies and Employment was designed to address, was the extent to which the unfavorable results (with respect to employment and income distribution) had originated from the policies adopted to encourage import substitution. By encouraging the development of capital-intensive industries and capital-intensive techniques of production, it was possible that the import-substitution policies adopted by developing countries had resulted in lower rates of growth of industrial employment than would have been expected under alternative, more outer-oriented trade and growth strategies.

The project, begun in 1976, has had three phases. A first phase was devoted to setting forth the theory underlying the trade strategies–employment relationship, and translating that theory into a meaningful program of empirical research. The second phase was undertaking studies of the trade strategies–employment relationship (in accordance with the program) of the experience of twelve countries and of a number of related issues on a cross-country basis. A final phase has used those results and other available evidence to analyze the empirical links between trade strategies and unemployment, and to see what empirical generalizations emerge from the experience of individual countries.

The results of much of the empirical work on individual countries were published in January 1981.[1] A second volume, focusing on the methodological and substantive issues related to factor supply and substitution possibilities, is in press.[2] The third volume, which I authored, analyzes the generalizations that emerge from the earlier studies, presents the theoretical underpinnings for the entire project, and is nearing completion.[3]

Since each of the country studies contains a wealth of data and analyses, it is not possible to do justice to those studies (nor to the substitution and factor market studies of the second volume) in a report such as this. I simply focus upon a few of the findings that emerge from the entire project, with a preliminary caution that this selective summary is no substitute for the analyses contained in the individual studies.

[1] *Anne O. Krueger, Hal B. Lary, Terry Monson, and Narongchai Akrasanee (eds.),* Trade and Employment in Developing Countries, 1: Individual Studies *(University of Chicago Press, 1980).*

[2] *This volume contains papers by James M. Henderson, Jere R. Behrman, T. Paul Schultz, Irving Kravis and Robert Lipsey, Jose Carvalho and Claudio Haddad, Victorio Corbo, and Patricio Meller.*

[3] *Authors for the country studies included in the first volume are: Brazil —Jose Carvalho and Claudio Haddad (Fundacao Getulio Vargas, Rio de Janeiro); Chile—Vittorio Corbo (International Institute of Quantitative Economics, Montreal) and Patricio Meller (Corporacion de Investigaciones Economicas para Latinamerica, Santiago); Colombia —Francisco Thoumi (Inter-American Development Bank); Indonesia —Mark Pitt (University of Minnesota); Ivory Coast—Terry Monson (Michigan Technological University); Pakistan—Stephen Guisinger (University of Texas at Dallas); South Korea—Wontack Hong (formerly of the Korean Development Institute, now of Seoul University); Thailand —Narongchai Akrasanee (Thammasat University, Bangkok); Tunisia —Mustapha Nabli (Faculte de Droit des Sciences Politiques et Economiques, Tunis); Uruguay—Alberto Bension and Jorge Caumont (Universidad de la Republica, Montevideo). In addition, doctoral dissertations at the University of Minnesota by Yung Wing Sung and Julio Nogues provided comparable analyses of Hong Kong and Argentina, respectively.*

First and foremost, in all the countries import-substitution industries competing with imports from developed countries were substantially more capital-using and labor-saving than were industries producing exports designed for developed countries. Given the wide diversity of conditions among the countries covered in the project, the degree of unanimity in this particular result is surprising. There was no instance where the import-substitution industries competing with developed countries appeared to generate more employment per unit of output, much less per unit of capital, than did the exportable industries.

Second, in many of the countries the import-substitution industries appeared substantially more intensive in the use of skilled labor than the industries producing for export, while the exportable industries were more intensive in the use of unskilled labor. Thus, the evidence from the studied countries indicates that the failure of employment opportunities to grow in manufacturing industries in developing countries may have been associated with the choice of import-substitution strategy.

Third, when developing countries exported to other developing countries (especially in the framework of a regional preferential trading arrangement), the relative labor and capital employment in the exportable industries in that trade were much more akin to those in their domestic import-substitution industries than to those in the industries exporting to developed countries. In Uruguay, for example, 441 workers were employed per $1 million of domestic value added in manufacturing exportable industries trading with developed countries; 238 workers were employed per $1 million of value added in import-competing industries, and 239 workers employed per $1 million of value added in goods destined for export to neighboring developing countries. Similar results were found for Argentina and Chile, where in fact, Chilean exports destined for Latin American trading partners were more capital-intensive and less labor-using than all Chilean import-competing industries.

These results strongly suggest that, for developing countries, the gains from trade in manufactures remain largely in trade with developed countries, so that they may export goods using their abundant factor of production: labor. Trade among developing countries, seen in that light, does not offer a substitute for trade with developed countries; this situation underscores the importance for their growth prospects of keeping developed country markets open for the products of the developing countries.

In addition to ascertaining labor coefficients in individual industries, country authors were asked to analyze the incentives for hiring capital and labor that existed in the various countries. In many cases, there were strong biases in various policy measures that strongly encouraged the use of capital-intensive techniques. In the case of Pakistan, for example, Guisinger estimated that the cost to a large-scale industry of using capital-intensive techniques of production was about one fourth what it might be in the absence of government subsidies and interventions. Eligible firms could import machinery and equipment duty free at a highly overvalued exchange rate. This factor alone gave those with import rights a cost of capital about 39 percent lower than he estimated would have occurred with a realistic exchange rate. In addition, eligible industrialists could obtain loans at an interest rate of about 5.7 percent from the government, whereas Guisinger estimated that a market rate of interest was closer to 15 percent. Finally, industrialists were entitled to use accelerated depreciation to write off their investments, and also to tax holidays in the case of some import-substitution industries. All told, these incentives reduced the cost of employing capital-intensive techniques by about 75 percent.

In other countries, other policies operated to produce the same bias in incentives. In Brazil, social insurance taxes added to the cost of employing labor; in Argentina, likewise, social insurance measures and minimum wage legislation appear to have raised the cost of employing unskilled labor, while credit subsidies and an overvalued exchange rate lowered the cost of employing capital-intensive techniques.

The orders of magnitude of the market interventions were surprisingly large in many of the project countries. Interestingly enough, however, they were substantially lower (if not almost nonexistent) in Singapore and South Korea, the two countries that had unequivocally adopted an outer-oriented, export promotion policy and eschewed import substitution. Indeed, in Brazil, considerable evidence indicated that the degree to which there were incentives for choosing capital-intensive techniques of production fell sharply after Brazil shifted from an inner-oriented to an outer-oriented strategy.

It was impossible to estimate the total impact that trade strategies and factor market interventions might have had upon the growth rate of urban employment opportunities in the project countries. Nonetheless, the findings were strong enough to confirm that relationship was clearly of great importance, and that the choice of an import-substitution trade strategy certainly contributed to the dismal record with regard to employment growth in many of the developing countries.

The findings of the project have provided strong evidence that there is no inherent conflict between the efficiency of resource allocation entailed in the choice of trade strategy and the employment-income distribution goals. Indeed, an import-substitution trade strategy that moves further away from an efficient allocation of resources is also likely to generate less demand for unskilled labor (and more demand for skilled labor) than would the alternative. To that extent, import-substitution trade strategies appear less efficient than outer-oriented strategies in promoting both economic growth and increased demand for unskilled labor.

Economic Outlook Survey

First Quarter 1981

Victor Zarnowitz

According to the median forecast from the latest survey of professional economic forecasters taken by the American Statistical Association and NBER, below-average but positive growth rates of total output of goods and services are predicted for the first three quarters of 1981. Real growth will accelerate to annual rates of more than 4 percent in 1981:4 and 1982:1. Thus, contrary to some individual predictions of a renewed decline, the consensus forecast does not anticipate a recession in the United States this year. The rate of inflation is expected to decline, but slowly.

Inflation Rates High but Declining

According to the median forecasts from the survey, the annual inflation rates for the GNP implicit price index will be 9.7 percent in both 1981:1 and 1981:2, down from the peak rate of 10.7 percent recorded in 1980:4. A sluggish but persistent further decline is expected, to rates of 9.2, 9,0, and 8.4 percent in 1981:3, 1981:4, and 1982:1, respectively. For the year 1981 as a whole, the index (1972 = 100) is supposed to reach 194.6, which is 9.7 percent up from 1980, whereas the increase projected for 1981:1–1982:1 is a more moderate 9.1 percent.

It is interesting to recall that in the preceding survey (November 1980) no consistent drift in the average forecasts of the price level was in evidence. The shift toward a somewhat more optimistic outlook on inflation may be associated with the greater credibility of monetary policy, as suggested by the reported assumptions of the forecasters (see below).

Slowdown and Recovery

Economic activity in 1980:4 was much stronger than most forecasters had anticipated at the time of the previous survey. On the average, the level of real GNP was underestimated by nearly 5 percent, that of industrial production by 4 percent. The projections in this survey incorporate upward revisions that aim to offset these errors. However, according to a large majority of the respondents, a slowdown is still the most likely prospect for the first half of this year. The median forecasts of growth in constant-dollar GNP, at annual rates, are 1.6 percent, 0.8 percent, and 2.4 percent in 1981:1, 1981:2, and 1981:3, respectively, all well below the long-term average consistent with high employment.

Finally, in 1981:4 and 1982:1, the recovery is expected to pick up, with output gains reaching 4 and 5 percent. As a result, the overall increase in the year ahead, from 1981:1 to 1982:1, will be 3.1 percent, as against only 1.5 percent for the year-to-year growth, 1980–81.

The index of industrial production (1967 = 100) will show very little movement in the first half of this year but respectable gains thereafter: the estimates for 1980:4, 1981:2, and 1982:1, for example, are here 149, 150, and 157. The projected increases at annual rates are: 1980–81, 3.0 percent; 1981:1–1982:1, 4.7 percent; 1981:3–1982:1,

Projections of GNP and Other Economic Indicators, 1981-82

	Annual			Quarterly							
					1981				1982	Percent Change	
	1980 Actual	1981 Forecast	Percent Change 1980 to 1981	1980 Q4 Actual	Q1	Q2	Q3 Forecast	Q4	Q1	Q4 80 to Q4 81	Q1 81 to Q1 82
1. Gross national product ($ bil.)	2626.5	2930.1	11.6	2732.3	2812.0	2879.0	2969.3	3060.0	3158.5	12.0	12.3
2. GNP implicit price deflator (1972 = 100)	177.4	194.6	9.7	183.8	188.1	192.5	196.8	201.1	205.2	9.4	9.1
3. GNP in constant dollars (bil. 1972$)	1480.9	1502.8	1.5	1486.5	1492.4	1495.2	1504.2	1519.4	1538.0	2.2	3.1
4. Unemployment rate (percent)	7.1	7.6	0.5[1]	7.5	7.6	7.7	7.6	7.5	7.3	0.0[1]	-0.3[1]
5. Corporate profits after taxes ($ bil.)	163.1	162.8	-0.2	164.1	156.0	158.0	164.0	173.0	180.0	5.4	15.4
6. Plant and equipment expenditures ($ bil.)	294.3	316.3	7.5	295.0	302.0	310.0	321.0	332.0	339.0	12.5	12.3
7. New private housing units started (ann. rate mil.)	1.30	1.46	12.3	1.53	1.35	1.40	1.50	1.60	1.70	4.6	25.9
8. Change in bus. inventories GNP accounts ($ bil.)	-5.3	3.3	-8.6[2]	-15.2	0.0	2.5	4.0	6.6	10.0	21.8[2]	10.0[2]

SOURCE: American Statistical Association and National Bureau of Economic Research, Business Outlook Survey, February 1981. The figures on each line are medians of twenty-seven to thirty-one individual forecasts.

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

6.7 percent. The pattern of slowdown and recovery is similar to that of real GNP but more accentuated, consistent with the familiar fact of greater cyclical sensitivity of manufacturing.

The total unemployment rate will creep up from 7.5 percent of the civilian labor force in 1980:4 to 7.7 percent in 1981:2, then decline to 7.3 percent in 1982:1. These average forecasts do not differ much from those of the previous survey, and they appear to be highly representative, as most of the individual predictions cluster rather tightly around them.

Major Assumptions

A large majority of the forecasters believe the bulk of the Reagan Administration's proposed income tax cuts and accelerated depreciation allowance will be enacted. Large increases in the national defense purchases are expected—16.6 percent in 1980-81, 14.3 percent between 1981:1 and 1982:1—but some respondents state that future rises will be less than proposed. Interestingly, few report explicit assumptions regarding the much publicized plans to reduce the federal government expenditures, and some note that the budget deficits will continue to be large.

Most of the forecasters now assume that monetary policy will remain restrictive. This is a shift from the previous survey in which the participants differed widely on this point, some expecting a looser, others a tighter Fed stance. A few survey participants assume that interest rates will be lower; none reports contrary premises. This too differs from the situation three months ago when views on the future of interest rates appeared to be much more divided.

Chances of Another Decline

The odds that constant-dollar GNP will decline during the year ahead are relatively low for most of the survey participants and getting smaller for each successive quarter covered, as illustrated by the following table.

Year and Quarter	Estimated Probability (Chances in 100) Less than 30	30-60	61 and over	Mean of the Estimated Probabilities
	Number of Forecasters			
1981:2	19	9	3	34
1981:3	27	4	0	18
1981:4	30	1	0	11
1982:1	30	1	0	9

Business Investment and Profits

Business expenditures for new plant and equipment are projected to be $316 billion in 1981, 7.5 percent higher than in 1980, but probably lower in real terms. In the second half of the year, however, business fixed investment is expected to grow much faster, at an annual rate exceeding 14 percent, which may be considerably higher than the rate of increase in the corresponding price level. In 1982:1, plant and equipment outlays should reach $339 billion, about 12 percent above 1981:1.

Corporate profits after taxes will decline 3.7 percent to $156 billion annual rate in 1981:1 but will increase steadily thereafter to $180 billion in 1982:1, according to the median forecasts from the survey. Such a rise of about 15 percent would still leave the profits lower, even in current dollars, than their most recent peak level of $183 billion in 1980:1.

A modest increase in business inventory investment is projected, from a net change of zero in 1981:2 to $10 billion annual rate in 1982:1. For 1980 as a whole, change in business inventories was -$3.0 billion; for 1981, it is estimated at $3.3 billion.

Consumer Capital Outlays

Housing starts will reach 1.7 million units at annual rate in 1982:1, a rise of 26 percent over the low estimate of 1.35 million for 1981:1. These median projections, which are fairly representative of the individual forecasts covered, reflect a dull level of activity in the housing industry compared with the recent nonrecession years.

Consumer expenditures for durable goods will increase from $212 billion in 1980 to slightly more than $236 billion in 1981, that is, by 11.5 percent, much like the growth rate in nominal GNP. Again, growth should be much greater after mid-1981, and, at annual rates of 16-18 percent, much should be in real terms. In 1982:1, outlays for consumer durables are estimated at $260 billion, about 15 percent above their year-earlier level.

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 Steven Kaplan of NBER, was responsible for tabulating and evaluating this survey.

NBER Profiles

Robert J. Barro

Robert J. Barro has been a research associate in NBER's Program in Economic Fluctuations since 1978. He received a B.S. in physics from the California Institute of Technology in 1965 and a Ph.D. in economics from Harvard in 1969.

Barro taught economics at Brown University from 1968-71, and at the University of Chicago from 1972-75. Since 1975, he has been professor at the University of Rochester. He was also a visiting fellow at Stanford University's Hoover Institution during 1977-78.

Barro is a fellow of the Econometric Society and an associate editor of its publication, *Econometrica.* He was editor of the *Journal of Political Economy* from 1973-75, was on the board of editors of the *American Economic Review* from 1976-79, and was an associate editor of the *Journal of Monetary Economics* from 1976-80.

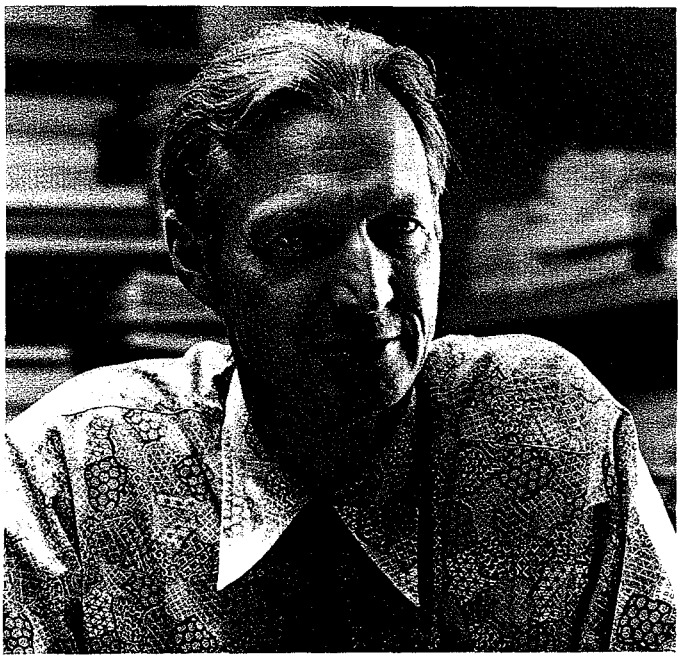
Barro's research interests include monetary, macroeconomic, and applied price theory. In addition to nu-

merous journal articles, Barro has written two books: *Money, Employment, and Inflation* (Cambridge University Press, 1976) and *Money, Expectations, and Business Cycles,* forthcoming from Academic Press. He is working on a textbook, *Macroeconomic Analysis,* intended to provide an accessible version of the "new classical macroeconomics." He is married and has three children.

Carl F. Christ

Carl F. Christ has represented the American Economic Association (AEA) on the Bureau's Board of Directors since 1975. Christ was born in Chicago and received a B.S. in physics and a Ph.D. in economics from the University of Chicago.

From 1950–55, he taught economics at Johns Hopkins University. From 1955–61, Christ was associate professor of economics at the University of Chicago. Since 1961 he has been professor of economics at Johns Hopkins, where he served as department chairman from 1961–66 and from 1969–70.



Christ was named a fellow of the Econometric Society in 1967 and a member of its council in 1976. He became a fellow of the American Statistical Association in 1970.

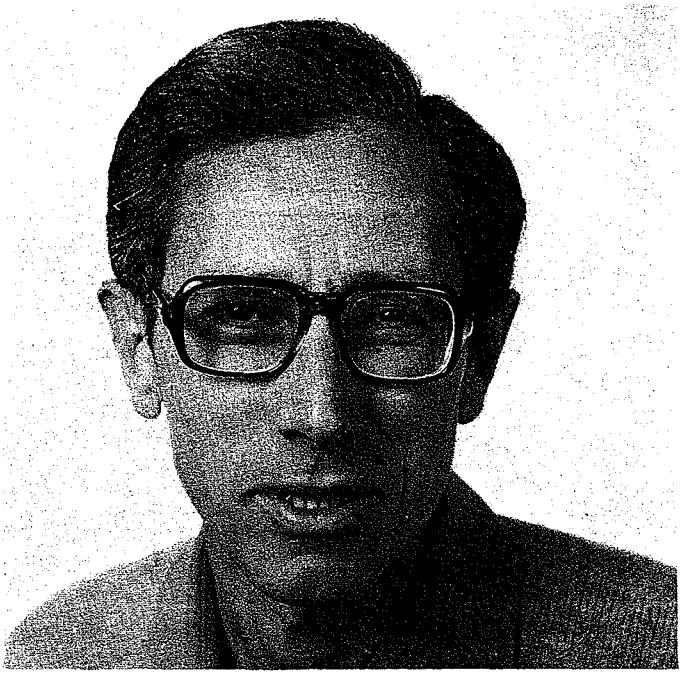
From 1969–77, Christ was a member of the Maryland Governor's Council of Economic Advisors. In 1979, he served as a consultant to the Special Studies Section of the Federal Reserve System, and in 1980 he was vice president of the AEA.

Christ's work, particularly in econometrics and macroeconomics, has been published extensively. He is the author of a 1966 text, *Econometric Models and Methods.*

Christ and his wife, Phyllis, reside in Baltimore and have three daughters, Alice, Joan, and Lucy. In his leisure time, Christ enjoys sailing.

Stanley Fischer

Research Associate Stanley Fischer is a member of NBER's Programs in Economic Fluctuations and in Financial Markets and Monetary Economics. He received his B.Sc. and M.Sc. from the London School of Economics, and his Ph.D. in economics from MIT.



From 1969–70, Fischer was a postdoctoral fellow in the economics department of the University of Chicago, where he taught economics from 1970–73; he has been on MIT's economics faculty since 1973.

In 1972, Fischer was a visiting senior lecturer at the department of economics of Hebrew University (Jerusalem). He returned as a fellow in the Institute for Advanced Studies there in 1976 for one year.

Since 1975, Fischer has been an associate editor of *Econometrica* and the *Journal of Monetary Economics.*

He was a member of the National Science Foundation's Economics Panel from 1978–80. He is also a fellow of the Econometrics Society.

In addition to writing numerous articles, Fischer has had two books published: with Rudiger Dornbusch of NBER and MIT, a text, *Macroeconomics;* and, as editor, *Rational Expectations and Economic Policy*, an NBER book (University of Chicago Press, 1980). Fischer and his wife live in Newton, MA, with their three children.

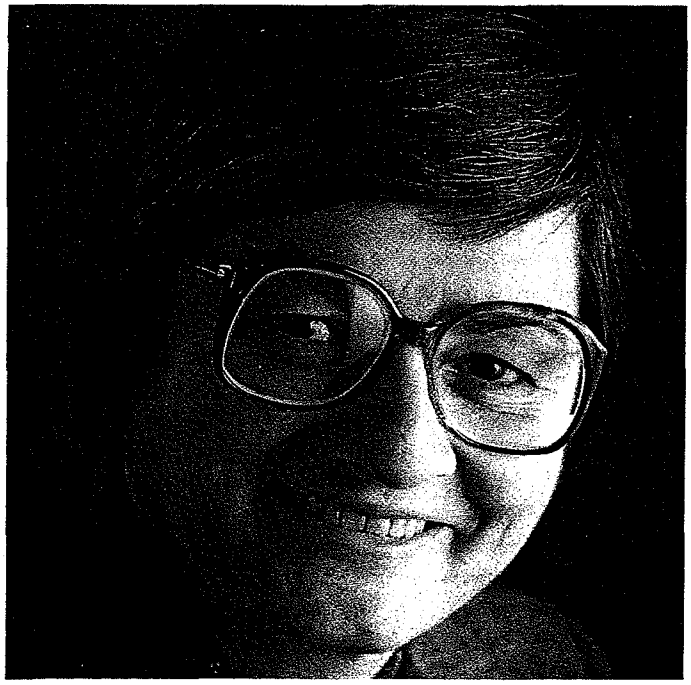
Anne O. Krueger

NBER Research Associate Anne O. Krueger has been a member of the Bureau's Program in International Studies since 1969 and has directed its Project on Trade Strategies and Employment since 1975. Born in Endicott, NY, Krueger holds a B.A. from Oberlin College and a Ph.D. from the University of Wisconsin, both in economics. She has taught economics at the University of Minnesota since 1959.

Krueger has been a visiting professor at Monash University (Australia), MIT, and Northwestern University. She has also served as a consultant to a number of organizations and government agencies including: the U.S. Agency for International Development, U.S. Information Agency, U.S. Treasury, National Science Foundation's Advisory Committee, and Harvard Institute for International Development.

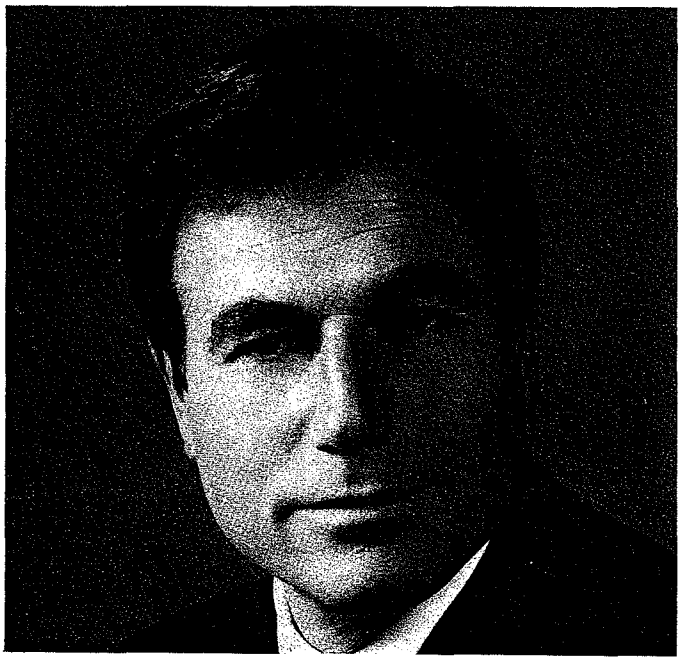
A director of the Overseas Development Council since 1975, Krueger has also been a member of its executive committee since 1976. In 1977, she was vice president of the American Economic Association; she is on the board of editors of its *Review* as well. Krueger also serves as associate editor of the *International Economic Review*.

Krueger has written extensively in the areas of foreign trade and international economic development. She is currently at work on a three-volume series for the NBER, *Trade and Employment in Developing Countries*. The first volume is now available throgh the University of Chicago Press (see *NBER Reporter*, Winter 1980, p. 21).



Michael H. Moskow

NBER Director Michael H. Moskow is executive vice president of International Jensen Incorporated, a subsidiary of Esmark, Inc. Moskow holds an A.B. in economics from Lafayette College and a Ph.D. in business and applied economics from the Wharton School of the University of Pennsylvania.



Early in his career, Moskow taught economics and directed the Bureau of Economic and Business Research at Temple University. He also served on the economics faculties of Lafayette College and Drexel University.

In August 1969, Moskow entered government service. He held seven governmental positions during the next several years, including: Under Secretary of Labor; Director of the Council on Wage and Price Stability; Assistant Secretary for Policy Development and Research at HUD; Assistant Secretary for Policy, Evaluation, and Research at the Labor Department; Executive Director of the Construction Industry Collective Bargaining Commission; and Senior Staff Economist for the Council of Economic Advisers.

Moskow left government service in January 1977 and served as a consultant to the Committee for Economic Development. In July 1977, he joined Esmark; he became vice president, corporate development and planning, in 1978, the position he held until November 1980 when he joined International Jensen. Also in 1978, President Carter appointed Moskow to the National Commission on Employment and Unemployment Statistics.

Moskow has written five books including, most recently, *Strategic Planning in Business and Government* (1978). He and his wife, Constance, live in Winnetka, IL, with their two sons, Robert and Eliot, and their daughter, Lisa.

Conferences

Pension Group Confers in Palo Alto

Members and guests of NBER's pension project met at the Bureau's Palo Alto office on January 8 and 9 for a Conference on Private and Public Pensions. Project Director John B. Shoven of Stanford University chaired the two-day gathering at which the following papers were discussed:

- Benjamin Friedman, NBER and Harvard University, "Pension Funding and Allocation of Pension Investment"
- Myron Scholes, NBER and University of Chicago, "Investigation of the Tepper/Black Funding and Allocation Theory"
- Stephen Kutner, SRI International, "An Empirical Study of the Retirement Decision"
- Gary Fields and Olivia Mitchell, Cornell University, "The Effect of Pensions on Retirement"
- Robert Merton, NBER and MIT, "A Theoretical Rationale for Social Security"
- Irwin Tepper, NBER and Harvard University, "Current Issues in the Funding of Pensions"
- Mordecai Kurz, NBER and Stanford University, "Social Security, Pensions, and Saving"
- Jeremy Bulow, NBER and Stanford University, "Early Retirement Pension Benefits"

Financial theory suggests that firms should fully fund their pensions to take advantage of tax benefits; in practice, however, many firms do not. One explanation is that firms prefer a "cushion" of underfunding that permits high pension contributions in good years and lower contributions in bad years, in order to "smooth" their reported income. Benjamin Friedman tests this hypothesis by comparing the volatility of firm income with and without pension contributions. He concludes that firms do engage in some smoothing but that the degree of smoothing is not directly related to the degree of pension underfunding.

Friedman also tests the Tepper/Black hypothesis on the allocation of pension assets. This hypothesis holds that firms should arbritrage taxes on interest by exclusively holding debt instruments in their pension portfolios and selling debt. However, Friedman finds no strong correlation between firms' debt/equity ratios and their pension investment strategies. This result suggests that firms have not widely adopted the tax arbitrage practice.

Myron Scholes's analysis questions some previous results in the literature about the rational management of pension funds. In particular, he questions the view that it is in the best interest of stockholders to fund pension plans up to the maximum allowed and to invest all assets of the pension fund in bonds rather than in common stock. He sees the firm acting as an escrow agent for the employees and suggests that many employees, particularly those who have most of their savings tied up in the pension program, might prefer a mixture of stocks and bonds in the pension fund.

Stephen Kutner presented a progress report on his recently completed survey of 4400 members of the California State Teachers Retirement System and his plans for analysis of the data set. He will examine the effects of pension provisions, direct financial inducements, alternative career possibilities, health, and other significant variables upon individual decisions to leave teaching. He hopes to increase the understanding of the retirement decision and to provide guidance for California's policy with regard to teachers' pensions.

Gary Fields and Olivia Mitchell, reporting on their long-term empirical project on retirement behavior, are now working on the first stages, including a thorough examination of the existing literature and a careful specification of a life-cycle model of behavior at or near retirement age. The researchers hope to capture the influence not only of current wages and pension provisions but also of potential wages and benefits conditional on continuing to work. They also plan to model the effect of various "offsets," such as taxes and pension contributions, that affect the value of continued work.

Robert Merton presented a novel theoretical rationale for the existence of a pay-as-you-go tax/transfer system (like the current Social Security program) in which benefits received are not directly tied to payments made. Merton believes that an optimal, well-diversified portfolio of assets would include some of all of the available assets in an economy, including human capital as well as physical capital. Thus, the lack of complete trading in human capital might pose a serious problem in portfolio selection. While there is some optimal ratio of human physical capital that an economic agent would want to maintain throughout life, people begin life with an excess of human capital relative to physical capital and typically have too little human capital later in life. Merton shows that if markets are not available in which investors can correct these imbalances, then a pay-as-you-go Social Security system, which taxes each worker's labor income but gives him or her a share in the productivity of future generations, could replicate the optimal situation of an economy in which human capital is completely tradable.

Irwin Tepper's analysis shows that corporate stockholders do not gain from the corporation's ability to shield income taxes by funding its pension programs. Tepper contends that since workers have similar tax shelters available to them as individuals, they are able to demand that the value of corporate tax breaks be paid out to pension recipients. In addition, Tepper disputes two commonly held beliefs about the funding of pensions: (1) funding of pensions increases total savings in the economy, and (2) funding avoids intergenerational transfers among stockholders.

Mordecai Kurz presented a theoretical model and some tentative empirical results concerning the behavior of saving over the life cycle. He notes that there are now two competing models for individuals' saving behavior:

(1) the life-cycle model, which presumes that individuals allocate consumption over their lifetimes to maximize their own utility; and (2) the intergenerational model, in which individuals allocate consumption and bequests over their lifetimes to maximize their own utility and that of future generations. He argues that these two models generate empirically distinguishable hypotheses.

Jeremy Bulow discussed the proper accounting methods for calculating accrued pension liabilities when corporations offer early retirement pension options that are "better than actuarially fair." Bulow's paper states that such firms, in calculating their pension liabilities, should assume that all workers will exercise the early retirement option, since any worker who stays will have to be compensated for the opportunity cost of not leaving, which includes exercising the early retirement option. He also notes that early retirement options can be a method for reducing the total compensation of older workers without reducing their salaries.

In addition to the authors, NBER research associates Marcy Avrin, Fischer Black, Zvi Bodie, Michael Boskin, Stanley Fischer, Victor Fuchs, Edward Lazear, Charles McLure, and David Wise; Research Economist Daniel Feenberg; and Research Fellow Lawrence Summers attended the conference. Invited guests who participated included: Emily Andrews and Selig Lesnoy, Social Security Administration; Jonathan Eaton, Princeton; Bert Hickman, William Sharpe, and Arthur Slepian, Stanford; Richard Ippoloto, U.S. Department of Labor; Anthony Lima, California State University at Hayward; Lynn Pollnow, National Science Foundation; A. Haeworth Robertson, Society of Actuaries; and Bert Seidman, AFL-CIO.

Tax Policy Analysis Studied

An NBER Conference on Simulation Methods in Tax Policy Analysis was held on January 25-27. The program was as follows:

SESSION I—LABOR SUPPLY STUDIES

Chairman: Martin Feldstein, NBER and Harvard University

Daniel Feenberg, NBER, and Harvey S. Rosen, NBER and Princeton University, "Alternative Tax Treatments of the Family"

Discussant: David Wise, NBER and Harvard University

Jerry Hausman, NBER and MIT, "Stochastic Problems in Simulation of Labor Supply"

Discussant: James Heckman, NBER and University of Chicago

Lawrence B. Lindsey, NBER, "Alternatives to the Current Maximum Tax on Earned Income"

Discussant: Joseph Minarik, The Brookings Institution

Session Discussant: Richard Musgrave, Harvard University and University of California at Santa Cruz

SESSION II—HOUSEHOLD BEHAVIOR

Chairman: John Shoven, NBER and Stanford University

Mervyn King, NBER and University of Birmingham (England), "The Tax Treatment of Housing"

Discussant: Patric Hendershott, NBER and Purdue University

Martin Feldstein and Lawrence B. Lindsey, "Simulating Nonlinear Tax Rules and Nonstandard Behavior: An Application to the Tax Treatment of Charitable Contributions"

Discussant: Harvey Galper, U.S. Department of the Treasury

SESSION III—INTERNATIONAL TAXATION

Chairman: Charles McLure, NBER

Daniel Frisch, NBER and University of Washington, "Issues in the Taxation of Foreign Source Income"

Discussant: Thomas Horst, U.S. Department of the Treasury

SESSION IV—SOCIAL SECURITY

Chairman: Charles McLure

Michael Boskin, Marcy Avrin, and Kenneth Cone, NBER and Stanford University, "Modelling Alternative Solutions to the Long-Run Social Security Funding Problem"

Discussant: Henry Aaron, The Brookings Institution

SESSION V—GENERAL EQUILIBRIUM TAX ANALYSIS

Chairman: Joseph Pechman, The Brookings Institution

Lawrence Goulder, Stanford University, John Shoven, NBER and Stanford University, and John Whalley, University of Western Ontario, "Domestic Tax Policy and the Foreign Sector"

Discussant: David Hartman, NBER and Harvard University

Don Fullerton and Roger Gordon, NBER and Princeton University, "Problems of Marginal versus Average Tax Rates in Tax Analysis"

Discussant: Charles McLure

Joel Slemrod, NBER and University of Minnesota, "A General Equilibrium Model of Taxation with Endogenous Financial Behavior"

Discussant: Peter Mieszkowski, NBER and University of Houston

SESSION VI—SAVINGS

Chairman: Charles McLure

Martin Feldstein and Daniel Feenberg, "Alternative Tax Rules and Personal Savings Incentives: Microeconomic Data and Behavioral Simulations"

Discussant: Martin Bailey, University of Maryland

Alan Auerbach, NBER and Harvard University, and Laurence Kotlikoff, NBER and Yale, "Progressive Taxation and National Savings"

Discussant: Joseph Stiglitz, NBER and Princeton University

SESSION VII—CAPITAL TAXATION

Chairman: John Shoven

Lawrence Summers, NBER and MIT, "Capital Taxation Reforms: A Micro Simulation Model"

Discussant: Robert Schiller, NBER and University of Pennsylvania

The Feenberg-Rosen paper examines four alternatives to the current tax treatment of married couples. Minor changes in the law, such as a 10 percent credit on the secondary worker's earnings or a 25 percent exemption of those earnings, appear to have little effect on labor supply. Income-splitting proposals, on the other hand, have a significant effect on both labor supply and tax revenues.

Hausman is also interested in modeling the effect of certain tax changes on labor supply. He first uses the current tax system and then looks at two alternatives similar to the Kemp-Roth bill: a 10 percent and a 30 percent reduction in income tax rates. He finds that "Kemp-Roth type tax cuts have large effects both in terms of decreasing deadweight loss and in decreasing government revenue."

Lindsey examines some alternatives to the maximum tax provision that is designed to set a ceiling of 50 percent on tax rates on earned income but is not always successful. His simulations of four alternative plans show that "well-designed tax rate cuts in the top tax brackets are likely to increase tax revenue" by encouraging work effort and discouraging tax avoidance.

Mervyn King presents a method of computing the gains and losses from various changes in government policy toward housing. First assuming unchanged behavior and then assuming behavioral responses to the changed policy, King evaluates certain reforms in light of the resultant trade-offs among their effect on average welfare, the distribution of welfare, and the ranking of individual households within that distribution.

Feldstein and Lindsey examine the potential effects of extending the allowance for charitable deductions to individuals who do not itemize their tax deductions. They estimate that individual contributions could increase by about 15 percent of the current total, and that tax revenues would fall by slightly less than the dollar amount of additional contributions. Placing a floor (that is, a minimum deduction level) of $300 would reduce revenue losses by 30 to 40 percent.

Frisch looks at U.S. tax policy toward multinational corporations and simulates the effects of nine possible reforms to current policy. He is interested in the effect that such reforms would have on corporations' investment decisions and on their tax liabilities.

Boskin, Avrin, and Cone look at a number of long-run policy alternatives to the troubled Social Security system. A number of strategies exist, any one of which would have a significant impact on the U.S. economy.

Goulder, Shoven, and Whalley describe four alternative formulations of the behavior of a foreign (external) sector in a tax model of the United States. With this specification, they reinvestigate the effect of an 80 percent savings deduction and integration of corporate and personal taxes. They also consider the impact of a 10 percent value-added tax. In all cases, "the evaluation of domestic tax policy is very sensitive to the functioning of international capital markets."

Fullerton and Gordon derive estimates of marginal tax and benefit rates and include them in a model used to evaluate the effects of tax integration or a shift to a consumption tax.

Relatedly, Slemrod simulates the impact of changing to a perfectly indexed tax system. "All in all," he concludes, "indexing the tax system of an economy like the United States in 1977 seems to lead to an efficiency gain, slightly hurts the lowest income classes, and substantially improves the welfare of the highest income groups."

Next, Feldstein and Feenberg consider two proposals for increasing personal saving: (1) creating a special savings account in which interest would be untaxed until withdrawal; and (2) excluding interest and dividends from taxable income. In either case, they find an incentive to save and a relatively modest reduction in tax revenues.

Auerbach and Kotlikoff develop a model of life-cycle saving and use it to analyze the welfare costs of taxing capital income, the effect of fiscal policy on saving, and the effect of other tax policies on saving.

Finally, Summers considers the influence of changes in tax laws on the stock market's value of firms and on firms' investment in plant and equipment. His estimates show that indexing for inflation can have a significant effect on those two areas.

Other participants at the conference included: James Barth, National Science Foundation; Edgar Browning, University of Virginia; Charles Clotfelter, University of Maryland; Daniel Holland, MIT; Martin Holmer, U.S. Department of Health and Human Services; Michael Salinger, NBER; William Vickrey, NBER and Columbia University; and Alvin Warren and Bernard Wolfman, Harvard University Law School.

The papers presented at the conference will be included in the NBER Working Paper series. In addition, a conference volume will be published, including both the formal discussions and a summary of the informal discussions that took place during the conference. Details of the availability of these publications will appear in subsequent issues of the *NBER Reporter*.

Inflation Discussion in Washington

About 100 representatives of business, government, nonprofit institutions, and the press met in Washington on February 27 for a second NBER Conference on Inflation. Although six nontechnical papers were presented, the primary focus was on the question-and-answer period that followed each author's synopsis of his work.

From Stanford University, authors John Shoven and Jeremy Bulow in their paper, "Inflation, Corporate Profits, and the Rate of Return to Capital," argue against the common view that, under inflation, corporate profits as reported are overstated. They assert that since corporations repay their debts in deflated dollars, their true economic profits are understated by billions of dollars.

In his paper, "U.S. Inflation and the Dollar," Jacob Frenkel of the University of Chicago believes that a re-

turn to a fixed exchange rate would be undesirable. Instead, he stresses that a stabilization of purchasing power of the dollar at home will automatically strengthen the dollar abroad and will limit its fluctuations.

In his paper, "Explorations in the Gold Standard and Related Policies for Stabilizing the Dollar," Robert Hall argues against a return to the gold standard; he proposes a commodity-backed dollar, based on commodities whose values have been relatively stable over the last three decades. A commodity standard is one way, but not the only way, Hall cautions, to restore stability to the dollar. The author is chairman of the Bureau's inflation project and professor of economics at Stanford University.

In "The Disruptive Effect of Inflation on the Organization of Markets," Dennis Carlton of the University of Chicago finds that inflation has pushed toward uniform products traded in highly organized markets. But consumers must now spend more effort in gathering information about prices which change frequently; thus, they are justly hostile toward inflation.

Jeremy Bulow's view in "The Effect of Inflation on the Private Pension System" is that private pension plans administered by firms have gained by inflation through higher interest rates, while pension recipients have lost out because their payments are generally not indexed for inflation.

Finally, Robert Gordon warns in "Why Stopping Inflation May Be Costly: Evidence from Fourteen Historical Episodes" that ending inflation could be costly in terms of decreased output and increased unemployment. Moreover, in 1970–71, even a mild recession did not bring inflation under control, and he cautions against contractions in demand as a cure for inflation in the United States.

All of the papers presented at the conference will be included in NBER's Conference Paper series; a conference volume and summary report are also planned. The *NBER Reporter* will announce the availability of these publications.

Research on Social Experiments

Economists and policymakers gathered on March 6 and 7 for an NBER Conference on Social Experimentation, organized by Jerry Hausman and David Wise, that included the following presentations:

Chairman: Zvi Griliches, NBER and Harvard University
Jerry Hausman, NBER and MIT, and David Wise, NBER and Harvard University, "Technical Problems in Social Experimentation: Cost versus Ease of Analysis"
Discussants: John Conlisk, University of California, San Diego, and Daniel McFadden, MIT

Chairman: Jerry Hausman
Frederick Mosteller and Milton Weinstein, Harvard University, "Toward Evaluating the Cost-Effectiveness of Medical and Social Experimentation"
Discussants: Joseph B. Kadane, Carnegie-Mellon University, and David Freedman, University of California, Berkeley

Chairman: Daniel McFadden
Dennis J. Aigner, University of Southern California, "The Residential Electricity Time-of-Use Pricing Experiments: What Have We Learned?"
Discussants: Paul Joskow, MIT, and Lester D. Taylor, University of Arizona

Chairman: David Wise
Frank P. Stafford, University of Michigan, "Income Maintenance Policy and Work Effort: Learning from Experiments and Labor Market Studies"
Discussants: Sherwin Rosen, NBER and University of Chicago, and Zvi Griliches

Chairman: Paul Joskow
Jeffrey E. Harris, MIT, "Micro-Experiments versus Macro-Experiments for Health Policy"
Discussants: Paul Ginsberg, Congressional Budget Office, and Larry L. Orr, U.S. Department of Labor

Chairman: Larry L. Orr
Harvey S. Rosen, NBER and Princeton University, "Housing Behavior and the Experimental Housing Allowance Programs: What Have We Learned?"
Discussants: John Quigley, University of California, Berkeley, and Gregory Ingram, World Bank

Chairman: David Wise
David Mundel, City of Boston Employment and Economic Policy Administration, "The Use of Information in the Policy Process"
Ernst W. Stromsdorfer, Abt Associates, "The Appreciation of Social Science Analysis to the Formulation of Public Policy"
Discussants: Henry Aaron, The Brookings Institution, and Laurence E. Lynn, Jr., Harvard University

In general, the authors show concern with the efficacy of social experiments (for example, income maintenance programs, housing allowances for the poor, off-peak pricing of electricity, and various health insurance options) as ways to evaluate such programs and how experiments are useful in policymaking.

Hausman and Wise began with an introduction to social experimentation and some general guidelines for enhancing the usefulness of experiments and correcting their inherent limitations. Mosteller and Weinstein focused on randomized, controlled experiments in health care and treatment, a subject Harris also examined. Aigner examined experiments in the pricing of electricity, while Stafford looked at income maintenance experiments with housing allowances.

In the final sessions, Mundel asked whether social experiments, in general, are useful in answering policy questions and, thus, whether experiments are cost-effective. Stromsdorfer was concerned with the manner in which legislators and policymakers use social science analysis to develop social policies.

Other participants in the conference included: Burt S. Barnow and Gary Burtless, U.S. Department of Labor; Kenneth Kehrer, Mathematica Policy Research; Stephen Kennedy, Abt Associates; Allen K. Miedema, Research Triangle Institute; Albert Rees, Alfred P. Sloan Foundation; Laurence C. Rosenberg, National Science Founda-

tion; and Peter Van Der Reyden, Netherlands Department of Social Affairs.

The papers presented at the conference will become part of the NBER Conference Paper and Working Paper series; their availability will be announced in future issues of the *NBER Reporter.*

Latin American Conference Held

A conference on "Financial Policies and the World Capital Market: The Problem of Latin American Countries," cosponsored by NBER, ITAM (Instituto Technologico Autonomo de Mexico), and IBM World Trade Americas/Far East Corporation, was held in Mexico City on March 26 and 27, with the following agenda:

Chairman: Javier Beristain, ITAM
Opening Remarks: Javier Beristain and Charles McLure, NBER
Carlos Diaz Alejandro, Yale University, "Stories of the 1930s for the 1980s"
Discussant: Miguel Mancera, Banco de Mexico

Chairman: Pedro Aspe, ITAM
Michael Mussa, University of Chicago, "Optimal Economic Integration"
Discussant: Miguel Urrutia, Fedesarrollo

Chairman: Maurice Obstfeld, NBER and Columbia University
Stanley Fischer, NBER and MIT, "Seignorage and the Case for a National Money"
Guillermo Ortiz, "Dollarization in Mexico: Causes and Consequences"
Discussants: Guillermo Calvo, Columbia University and Centro de Estudios Macroeconomicos de Argentina (CEMA), Pentti Kouri, NBER and New York University, and Thomas Sargent, NBER and University of Minnesota

Chairman: Charles McLure
Nissan Liviatan, Hebrew University, "On Equilibrium Wage Indexation and Neutrality of Indexation Policy"
Discussants: Mario Henrique Simonsen, Fundacao Getulio Vargas (FGV), and Edmar L. Bacha, Pontificia Universidade Catolico do Rio de Janeiro (PUC)
Michael Bruno , NBER and Hebrew University, "Real versus Financial Openness under Alternative Exchange Rate Regimes"
Discussant: Peter Garber, NBER and University of Virginia

Chairman: Olivier Blanchard, NBER and Harvard University
Domingo Cavallo and A. Humberto Petrei, University of Cordoba, "Financing Private Business in an Inflationary Context: The Experience of Argentina between 1967 and 1980"
Discussants: Andrew Abel, NBER and Harvard University, and Charles McLure

Chairman: Mario Henrique Simonsen
Andre Lara-Resende and Francisco Lopes, PUC , "Wage and Exchange Rate Policy, the Balance of Payments, and Inflation: Some Dilemmas Facing the Brazilian Economy in the Coming Years"
Discussant: Olivier Blanchard
Guillermo Calvo, "Trying to Stabilize: Some Theoretical Reflections Based on the Case of Argentina"
Discussants: Herminio Blanco, Rice University, and Ricardo Ffrench-Davis, Cieplan

Chairman: Nissan Liviatan
Jose Saul Lizondo, ITAM, "Interest Differentials and Covered Arbitrage"
Discussant: Kenneth Rogoff, Federal Reserve Board

Chairman: Rudiger Dornbusch, NBER and MIT
Robert Cumby, International Monetary Fund, and Maurice Obstfeld, "Capital Mobility and the Scope for Sterilization"
Discussant: Pedro Aspe

Panel Discussion: "The Capital Market under Conditions of High and Variable Inflation"
Chairman: Leopold Solis, Banco de Mexico
Panel: Juan Carlos de Pablo and Miguel Mancera, Banco de Mexico, John Shoven, NBER and Stanford University, Mario Henrique Simonsen, and Lawrence Summers, NBER and MIT

The conference goal was to study the problems of financial management in the advanced, developing Latin American countries. These countries have experienced rates of inflation out of line with those in the rest of the world and must now design institutions that will foster both an efficient financial system and stable economic growth. The papers, written by scholars from the United States and the developing Latin American economies, analyze individual countries' experiences and attempt to draw more general conclusions from the total Latin American experience.

The papers presented will become part of the NBER Conference Paper series and will be submitted for consideration for publication as a conference volume. Their availability will be announced in future issues of the *NBER Reporter.*

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 Summer issue of the *Reporter* is June 16. If you have any questions about procedures for submitting materials for the calendar, please call Kirsten Foss at (617) 868-3974.

May 1, 1981
Program Meeting: Taxation, NBER

May 8, 1981
Program Meeting: Labor Studies, NBER

May 15-16, 1981
Inflation and Financial Markets, NBER

May 18-19, 1981
Symposium, National Tax Association*

June 18-19, 1981
International Seminar in Macroeconomics, NBER

June 24-27, 1981
North American Summer Meeting, The Econometric Society

June 25-26, 1981
Social Security Financing, American Enterprise Institute

August 24-28, 1981
Applied General Equilibrium Models, NBER

August 31-September 4, 1981
European Meeting, The Econometric Society

September 17-18, 1981
Panel on Economic Activities, Brookings Institution

September 25-26, 1981
Conference on *Prices and Quantities*, Brookings/Yale/Columbia

Fall 1981
Hispanic Labor Force in the United States, Poverty Institute/Wisconsin State Department of Health and Social Services

October 2-4, 1981
R and D Conference, NBER

October 4-8, 1981
Annual Conference, National Tax Association*

October 13-15, 1981
Applied Time-Series Analysis, NBER/CEME/ASA/Census Bureau

November 4-6, 1981
Annual Meetings, Southern Economic Association*

November 12-13, 1981
Housing and Energy, Brookings Institution

November 20-21, 1981
Exchange Rates and International Macroeconomics, NBER
Conference on Public Policy, Carnegie-Mellon/Rochester

December 3-4, 1981
Conference on Wage Measurement, NBER (Income and Wealth)

December 17-18, 1981
Conference on Exchange Rates, NBER

December 28-30, 1981
Annual Meetings, American Economic Association
North American Winter Meeting, The Econometric Society

January 25-29, 1982
Conference on Exchange Rates, NBER
(Rescheduled from September 8-10, 1981)

March 18-21, 1982
The Classical Gold Standard, NBER

April 1982
Conference on Economic Fluctuations, NBER

June 21-22, 1982
International Seminar in Macroeconomics, NBER

June 28, 1982
Econometrics and Public Finance, NBER

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

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

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

September 1983
First Quarter Century of Cliometrics, NBER

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

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

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

Bureau News

The Timing and the Severity of the Recession of 1980

Victor Zarnowitz and Geoffrey H. Moore*

In the sixty years of its existence, the National Bureau of Economic Research has been continuously engaged in studies of business cycles. Among the most widely used results of that program are the chronologies of periods of general economic expansion and contraction in the United States and several other countries. These are lists of annual, quarterly, and monthly dates that mark the peaks (signaling the start of recessions) and troughs (which signal the beginning of recoveries). For the United States, England, France, and Germany, these "reference chronologies" extend back more than 130 years.[1]

The following is a brief report on the most recent NBER work in this area. On June 3, 1980, the Bureau's Committee on Business Cycle Dating issued a statement identifying January 1980 as the latest peak in the sequence of U.S. business cycles.[2] At the time no cyclical peak in real GNP had yet been recorded; indeed, that series had continued to increase to the first quarter of the year (1980:1). Thus the determination that the economy was already in a cyclical decline for some five months was by no means obvious and by historical standards relatively early.

The NBER judgment as to the date of the peak was strongly supported by a comprehensive analysis of contemporary economic conditions. Following a long period of very little growth in 1979, most of the important monthly indicators of macroeconomic activity declined early in 1980. The movements formed a sufficiently consistent pattern to denote a transition from a phase of slow growth to one of a cyclical contraction. Similar slowdown-and-recession sequences have been repeatedly observed in the past. In June, the fragmentary evidence for the second quarter of 1980 suggested that the economy was deteriorating much faster than in the first quarter.

About a month after the NBER dating decision, more complete, though still preliminary, figures for the second quarter became available. Eventually, it turned out that real GNP fell at a record annual rate of 9.9 percent in 1980:2. Together with other evidence that had become available, this clearly confirmed the occurrence and documented the deepening of the recession.

*NBER research associate and professor of economics and finance, University of Chicago, and NBER director and director, Center for International Business Cycle Research, Rutgers University, respectively.

[1]For further detail and references, see Geoffrey H. Moore, Business Cycles, Inflation, and Forecasting (Cambridge, MA: Ballinger Publishing Company for the National Bureau of Economic Research, 1980), chapter 1.

[2]Members include NBER Director Geoffrey H. Moore and the following NBER research associates: William Branson (Princeton), Martin Feldstein (Harvard), Benjamin Friedman (Harvard), Robert Gordon (Northwestern), Robert Hall, chairman (Stanford), and Victor Zarnowitz.

Table 1 lists the dates of the most recent cyclical peaks in fifteen monthly and five quarterly series on output, employment, real sales, and some related processes. This set includes only comprehensive measures of eco-

TABLE 1. Chronology of Cyclical Peaks in Twenty Series on Aggregate Output, Employment, Real Income, Expenditures, and Sales, 1979–80

Date of Peak	Monthly Series	Quarterly Series (middle month of quarter)	Number of Series Reaching Peaks
March 1979	*Mfg. and trade sales, 1972$ Wages in goods industries, 1972$		2
June 1979	Number of unemployed (inverted)		1
July 1979	Unemployment rate (inverted) Insured unemployment rate (inverted)		2
September 1979	Retail sales, 1972$		1
January 1980	Index of coincident indicators[1] *Industrial production, total[2] Employment in goods industries Nonfarm employee hours Personal income, 1972$ *Personal income less transfer payments, 1972$		6
February 1980	Total civilian employment Nonfarm employment, household survey *Nonfarm employment, establishment survey	GNP, 1972$ Final sales, 1972$ Disposable income, 1972$ Goods output, 1972$ Personal consumption expenditures, 1972$	8
Number of Series	15	5	20

Note: Series are listed according to the timing of their cyclical peaks as dated in the first column. For quarterly series, the turning points are identified by the middle month of the quarter. All monthly series are in physical units (aggregates or rates of employment and unemployment, indexes of production), except for five income or sales aggregates in constant (1972) dollars. All quarterly series are constant-dollar aggregates from the national income and product accounts.

[1]This BEA index (1967 = 100) is a weighted composite of the four monthly series marked * in this table. Its value was slightly higher in March 1979 (146.6) than in January 1980 (146.1) but the latter date is more representative. The three-month averages centered on the two dates are 145.2 and 145.6, respectively.

[2]The March 1979 value (153.5) is slightly higher than the January 1980 value (152.7), but the latter is a better choice by the test of the centered three-month averages (which are 152.4 and 152.6, respectively).

nomic performance that show directly whether business activity is rising or falling; hence, the series are classified as "roughly coincident" with the historical chronology of business cycle turning points. Indeed, most of these indicators have been used by the NBER in its past work on dating cycles. The table omits the "leading indicators" representing marginal employment adjustments, business and residential investment commitments (new orders and contracts, starts and permits, and so forth), money and credit flows, sensitive prices, and profits. Most of these early-warning cyclical indicators began declining in 1978 or the first half of 1979. Even so, the dispersion of the specific peak dates in table 1 is rather wide.

The list of the downturns discloses scattered turns during 1979, but the principal cluster is in January–February 1980, with a large concentration of series on real income, real GNP, industrial production, and employment.

Short, random movements and measurement errors ("noise") obscure the evidence of any single time series. A group of indicators contains less noise and is therefore, on the whole, more reliable. There are statistical procedures to standardize different series so that they can be meaningfully combined, as applied in the monthly coincident index of the U.S. Department of Commerce, included in table 1. This index followed an almost entirely flat course between March 1979 and January 1980 (see table 1, footnote 1) but declined sharply thereafter.

When other monthly indicators and the quarterly GNP series in real terms are added, the resulting broader composite indexes also peak in January 1980. This reflects largely the fact that, although housing construction and real manufacturing and trade sales weakened early, the rest of the economy, mainly services and business fixed investment, held up relatively well during 1979. The personal saving rate fell to unusually low levels in this period of widely anticipated inflation and low real interest rates, a situation that helped prop up the economy temporarily despite the slow erosion of real aftertax income of a large part of the private sector.

Based on this evidence (consisting mainly of data through April 1980), the NBER committee concluded that January 1980 was the best choice for the business cycle peak date.[3] However, it warned that the selection was still tentative because of the risks of data revisions, particularly since the initial decline in the winter was rather hesitant; the decline in economic activity accelerated greatly in the spring quarter. In mid-March, credit restraints of unprecedented severity in peacetime were suddenly imposed by the Federal Reserve. The reaction to this unanticipated shock treatment turned out to be very strong. For example, total private borrowing (change in the debt of businesses and households) dropped 51 percent in 1980:2, from $353 billion to $171 billion (at seasonally adjusted annual rates). At the same time, growth rates of monetary aggregates fell sharply, partly into the negative range. Interest rates shot up to peaks of 14–20 percent in March and April, then fell abruptly to 7–12 percent in June and July.

The phase of rapid contraction was short-lived. The Fed moved in May to soften the credit controls and eliminated them completely on July 3. Private borrowing increased promptly and strongly in 1980:3. Reduced rates of increase in consumer prices and declines in interest rates helped improve consumer expectations and buying attitudes. Real retail sales and housing starts turned upward. The decline in the coincident index came to a halt in June–August, and the decline in real GNP in 1980:3. These events had been signaled by the leading index, which reached its lowest point in May.

The initial rise in that index has been as large as it usually is early in a business recovery—over 12 percent in May and November 1980, for example. Correspondingly, activity picked up strongly in many areas of the economy, although some, notably the automobile industry, remained depressed. Thus industrial production gained 6.4 percent in July–November (a very vigorous annual rate of 20.5 percent).

Monetary growth accelerated greatly in the summer and fall of 1980. Fears that the new surge of money and credit creation will result in greater inflationary pressures, and that the Fed will once more precipitate a drastic retrenchment, fueled a second round of sharp interest rises within one year. Thus the prime rate rose above 20 percent (its previous high of late April) in the second half of December. At the concurrent inflation rates, the burden in real terms of these high costs of money was plain to see, and they soon became the focus of widespread expectations that the young recovery would falter.

The prospects for a sustained expansion are indeed uncertain. With the data available at the present time (early March 1981), July 1980 appears the most reasonable trough date. However, this date has not been reviewed or approved by the NBER Business Cycle Dating group, and it would be invalidated should another sufficiently large decline in aggregate economic activity develop in the near future.[4] Consequently, no reference date for the beginning of a new business expansion can as yet be identified with adequate confidence, and none has been determined by the NBER committee.

Nevertheless, it is interesting to ask how this last recession compares with the previous ones, a question that requires some preliminary cutoff date for the 1980 contraction. If the trough did in fact occur in July, real GNP will have declined for one quarter only in this recession, which is unusual—although the NBER, for good reasons, never agreed with the popular notion that a recession requires as a minimum two consecutive quarterly declines in real GNP. Thus some may query whether

[3] *The Committee did not fix a quarterly or annual peak date, but in our view the quarterly peak was the first quarter of 1980 and the annual peak was 1979.*

[4] *That is, if, after a recovery of less than a year, economic activity should decline to a lower level than it reached in mid-1980, the July 1980 trough would not hold. The shortest business cycle expansion in the NBER chronology for the United States lasted ten months (8/1918–3/1919). Incidentally, this expansion was followed by the shortest contraction of seven months (3/1919–1/1920). If July 1980 proves to be a trough, the 1980 recession will have lasted six months only. For the NBER chronologies of business cycles, see G. Moore,* op. cit., *Appendix table A-1.*

TABLE 2. Selected Measures of Duration, Depth, and Diffusion of Business Cycle Contractions, 1948-80[1]

	Nov. 1948 Oct. 1949 (1)	July 1953 May 1954 (2)	Aug. 1957 Apr. 1958 (3)	Apr. 1960 Feb. 1961 (4)	Dec. 1960 Nov. 1970 (5)	Nov. 1973 Mar. 1975 (6)	Jan. 1980 July 1980[2] (7)
Duration (months)							
Business cycle	11	10	8	10	11	16	6
GNP, constant dollars	6	12	6	9	15	15	3
Coincident index	12	15	14	13	13	16	6
Industrial production	15	9	13	13	13	9	6
Nonfarm employment	13	16	14	10	8	6	5
Depth (percent)[3]							
GNP, constant dollars	-1.4	-3.3	-3.2	-1.2	-1.1	-5.7	-2.6
Coincident index	-10.8	-9.2	-12.4	-6.8	-6.3	-13.9	-7.0
Industrial production	-10.1	-9.4	-13.5	-8.6	-6.8	-15.3	-8.5
Nonfarm employment	-5.2	-3.4	-4.3	-2.2	-1.6	-3.7	-1.4
Unemployment rate							
Maximum	7.9	6.1	7.5	7.1	6.1	9.1	7.6
Increase	+4.5	+3.6	+3.8	+2.3	+2.7	+4.2	+2.0
Diffusion (percent)[4]							
Nonfarm industries, maximum percent with declining employment	90	87	88	80	80	87	75
Date when maximum reached	Feb. 1949	Mar. 1954	Sept. 1957	Oct. 1960	May 1970	Feb. 1975	Apr. 1980

SOURCE: U.S. Department of Commerce, U.S. Department of Labor, Board of Governors of the Federal Reserve System, National Bureau of Economic Research. For a similar table carrying the record back to 1920, see G. Moore, *op. cit.*, Appendix table A-2.

[1]From peak (first date) to trough (second date).

[2]Tentative: month of lowest value during 1980 of the composite index of four concident indicators. This date may or may not prove to be the trough of the recession that began in January 1980.

[3]Percentage change from the peak month or quarter in the series to the trough month or quarter over the intervals shown above. For the unemployment rate, the maximum figure is the highest for any month associated with the contraction, and the increases are from the lowest month to the highest, in percentage points.

[4]Since 1960 (columns 4-7) based on changes in employment over six-month spans in 172 nonagricultural industries, centered on the fourth month of the span. Prior to 1960 (columns 1-3) based on cyclical changes in employment in 30 nonagricultural industries. For the latter index, the figures comparable to those in columns 4-6 are as follows: Apr. 1960-Feb. 1961: 82, Aug. 1960; Dec. 1960-Nov. 1970: 83, June 1970; Nov. 1973-Mar. 1975: 90, Jan. 1975. No overlap is available for the 1980 recession.

the 1980 decline did have the dimensions of a business cycle contraction.

Table 2, based on the assumption that the recession ended in July, removes such doubts. Although short, the 1980 decline in real GNP was larger than the declines in three of the six earlier post-World War II recessions. The total loss in the coincident index exceeded the one that occurred during the recession of 1960 and that of 1970. The comparisons for industrial production lead to a similar conclusion. Only in terms of the changes in employment and unemployment can the 1980 contraction be considered the mildest of the seven episodes since 1948. The trend toward milder declines in employment has been going on for many years, largely because of the growth in employment in the service industries, which as a rule are more recession-proof than the goods-producing industries.

According to the new estimates just released, real GNP increased at a 2.4 percent annual rate in the third quarter and at a 4.0 percent annual rate in the fourth quarter of 1980. The first of these figures falls short of, but the second exceeds, the long-term growth rate of U.S. aggregate output. Other indicators also suggest that July 1980 may mark the trough in the growth cycle, that is, the end of the below-trend phase that began in December 1978.[5] In particular, the rise in the coincident index after July 1980 was far greater than the long-term average growth rate for this series. Historically, the business cycle troughs and the growth cycle troughs have often coincided. On the assumption, albeit very tentative, that this will again prove to be the case, the latest low-growth phase would have lasted nineteen months (December 1978-July 1980), which is very close to the average for these periods after World War II (eighteen months). Hence, although the business cycle contraction was unusually short, the growth cycle contraction was of typical length.

In conclusion, the 1980 declines in the indicators of major economic activities were relatively short but widespread and deep enough to qualify as another business cycle contraction.

[5]*Growth cycles are defined by the consensus of fluctuations in trend-adjusted data for the physical volume of aggregate economic activity. For a brief explanation of this concept and the chronology of U.S. growth cycles 1948-78, see G. Moore,* op. cit., *chapter 2 and Appendix table A-4.*

Exchange Rates Discussed

Members of NBER's Program in International Studies met at the Bureau's New York office on December 18 to discuss current research on exchange rates and plans for a September workshop on that subject.

In the first of four papers, "Consumption Preferences, Asset Demands, and Distribution Effects in International Financial Markets," Paul Krugman, of NBER and MIT, argues that in a model of portfolio distribution across currencies, which takes into account the international distribution of investors' consumption bundles, risk aversion is not a likely explanation of the diversification and preference for the home currency.

Pentti Kouri, of NBER and New York University, presented "A General Equilibrium Approach to International Financial Markets." The general equilibrium model can show, for example, how changes in riskiness of nontraded assets in one country can influence the price of nontraded assets in another country. The Krugman and Kouri models have similar characteristics, thus generating a lively discussion.

In the afternoon session, Michael Mussa of the University of Chicago Business School pointed out how "news" about the current account moves the exchange rate through its implications of future changes in stocks of assets.

The last paper of the meeting was presented by NBER Faculty Research Fellow Robert Flood of the Federal Reserve Board and the University of Virginia, and NBER Research Economist Peter Garber of the University of Rochester and the University of Virginia. In "The Effect of Expectations of Future Fixing in the Current Floating Exchange Rate," the authors show how the value of the floating rate is influenced by market perceptions that the rate will be fixed at a future date. Their example is the post-World War I refixing of sterling in 1925.

Other members of the exchange rate project who attended the New York meeting were: NBER research associates John Bilson, University of Chicago Business School, and Richard Marston, University of Pennsylvania; Research Fellow, Maurice Obstfeld, Columbia University; NBER research affiliates Jacques Artus, IMF, and Dale Henderson, Federal Reserve Board; and Program Director William Branson, Princeton University. Also participating were: Stanley Black, Vanderbilt University; Bernard Dumas, CESA, Paris; Roman Frydman, New York University; and Jorge de Macedo, Princeton University.

Meeting of Financial Markets Group

Members of NBER's Program in Financial Markets and Monetary Economics met in Cambridge on January 22 to discuss the following papers:

John Makin, University of Washington, "Anticipated Money and Real Economic Activity"

Stanley Fischer, MIT, "Toward an Understanding of the Cost of Inflation"

Edward Kane, Ohio State University, "Nested Tests of Term Structure Theories"

Charles Freedman, Bank of Canada, "Some Theoretical Aspects of Base Control"

Patric Hendershott, Purdue University, "Equity and Debt Returns"

Zvi Bodie, Boston University, "Inflation and the Demand for Debt-Equity Securities"

Makin's paper examines the effects of anticipated and unanticipated money growth on the rate of change of employment and real GNP with inflation uncertainty controlled for. The results suggest that anticipated money growth has a greater effect than unanticipated money growth. This conclusion is independent of the additional finding that uncertainty depresses employment and real GNP growth.

Fischer's paper discusses four types of costs that might be related to inflation. First, patterns of payments are disrupted when attempts to economize on the holding of money rise with inflation. The costs of these disruptions have become significant—on the order of $8 billion a year in 1980—since the inflation rate has risen to around 10 percent. Second, distortions resulting from the failure to adjust the tax system for inflation imply a cost possibly larger than that related to holding money. Third, to the extent that higher inflation also means more uncertainty about the price level, there are uncertainty costs of high inflation. These are at least on the order of several billion dollars a year. Finally, there is a relationship between the inflation rate and the variability of prices of different goods. This paper argues that the link (between inflation and the variability of individual prices) reflects a common third factor—oil price rises—and therefore should not be regarded as a cost of inflation itself. The overall conclusion is that the costs of inflation are substantial, and well in excess of the $8 billion per year of the traditional estimate.

Controversies in the theory of term structure center around the existence and variability of term premiums in securities yields. In Kane's paper, the term premium on a default-free, n-period bond is defined as the difference between its observable yield to maturity and the average *expected* per annum rate of return on an n-period strip of rollover investments in one-period bonds. To test alternative term structure theories without introducing ex post proxies for expectational variables, the paper uses a set of cross-section interest rate forecasts. Statistical tests strongly confirm the existence of term premiums at each survey date, thereby rejecting the pure expectations theory of the term structure. Additional tests are unable to reject restrictions implied by the liquidity premium hypothesis that term premiums should be positive and increase with maturity. Finally, contrary to the martingale hypothesis, ex ante term premium data vary significantly over time and show a positive association with the level of interest rates.

Freedman's paper focuses on the implications of using the monetary base or bank reserves as an instrument to control a monetary aggregate. After examining a series of theoretical models of increasing complexity, he concludes that in a system with either institutional or structural lags, base control may entail very sharp and possibly undamped oscillations of short-term interest rates. The shorter the time period over which the authorities choose to bring the monetary aggregate back to its target, the more volatile will be the movements of interest rates. Furthermore, there is an asymmetry in the U.S. institutional structure such that rigid implementation of the base control system will periodically lead to a decline in short-term interest rates to very low levels.

Hendershott discussed his preliminary work with Roger Huang on ex post debt and equity returns. The enormous fluctuations in the real Treasury bill rate (plus 12 percent to minus 15 percent) during the 1926–51 period, in contrast with the last thirty years, are noted and attributed largely, but not entirely, to a nonnegativity constraint on nominal bill rates in deflationary periods and the pegging of nominal interest rates in inflationary periods. Their most striking finding, though, is the consistent extraordinarily large returns on equities relative to bonds around NBER business cycle troughs (all ten cycles since 1927) and small returns around NBER business cycle peaks (all five cycles since 1953).

Bodie presented a progress report on his research on inflation and the demand for debt and equity securities. Preliminary results seem to indicate that the minimum risk strategy is to invest almost entirely in bills, hedging against unanticipated inflation with a small position in commodity futures. To attain higher expected real rates of return, an individual must invest ever-increasing amounts in stocks and commodity futures; in so doing, however, the investor is exposed to increasing degrees of risk. Bodie offers estimates of the terms of the resulting tradeoff between risk and expected return.

In addition to the authors, program members attending the meeting included: John Ciccolo, Boston College; Program Director Benjamin Friedman, Harvard University; Roger Gordon, Bell Laboratories; Michael Hamburger, New York University; David Jones, Northwestern University; Stewart Myers, MIT; Vance Roley, Federal Reserve Bank of Kansas City; Robert Shiller, University of Pennsylvania; John Taylor and Carl Walsh, Princeton University; and Irwin Tepper, Harvard University.

Research on Economic Fluctuations Discussed

A program meeting on economic fluctuations was held in Cambridge on January 29 and 30, with seven papers presented and discussed:

Robert Solow, MIT, "Wage Bargaining and Employment"

Sanford Grossman, University of Pennsylvania, and Laurence Weiss, NBER and Yale University, "Heterogeneous Information and the Theory of the Business Cycle"

Olivier Blanchard, NBER and Harvard University, "The Production and Inventory Behavior of the American Automobile Industry"

Peter Diamond, MIT, "Aggregate Demand Management in Search Equilibrium"

Paul Evans, Stanford University, "Monetary Uncertainty and the Unemployment Rate"

John Bilson, NBER and Stanford University, "A Proposal for Monetary Reform"

Robert Hall, NBER and Stanford University, "The Role of the Government in Stabilizing Prices and Regulating Money"

Solow's paper asks why real wages might be sticky and why fluctuations in demand have a major effect on employment but a small and unsystematic effect on real wages. He considers cases in which unions and firms bargain in alternative ways over wages and employment. Sticky real wages and fluctuating employment are in the mutual interest of unions and employers, in Solow's analysis.

Grossman and Weiss explore the theory that incomplete information causes confusion about real variables and leads to larger-than-called-for variations in output. Assuming that firms invest to the point where the (supply) price of capital equals the marginal productivity of capital, what if nominal rates do not accurately reflect the real cost of capital? Labor, output, consumption, and real interest rates would vary more than with complete information.

Blanchard sets out to learn more about inventory behavior and production behavior. He finds that production in the auto industry appears to be based on intertemporal optimization with rational expectations. He finds that substantial costs in changing production lead to production smoothing. There are also substantial costs, he observes, in straying from a target inventory (based on current sales).

Diamond's paper presents a simple, general equilibrium model of search activities in labor and commodity markets. In the model, the competitive equilibrium level of production may be too low; higher output could improve trading opportunities, so a small move from equilibrium to greater economic activity may improve welfare.

Evans investigates the relationship between monetary uncertainty and the unemployment rate. He finds support for Milton Friedman's view that monetary uncertainty *raises* the unemployment rate. He also finds that:

(1) Most of the shift in the unemployment rate since the 1930s is due to changes in the natural rate of unemployment.

(2) The natural rate of unemployment has risen about three percentage points since 1972.

(3) The availability of unemployment insurance since 1953 has raised the U.S. unemployment rate by 3.8 percentage points.

(4) Disinflation can also have a high cost in unemployment.

(5) Changes in systematic monetary policy can lower monetary uncertainty and permanently lower the U.S. unemployment rate.

Bilson spells out a proposal for reducing the inflation rate to zero or below through monetary reform. He suggests that the dollar become an equity claim on a share of the Federal Reserve's portfolio of real and foreign assets. This would work like a return to the gold standard with dollars backed by Fed holdings rather than gold. Bilson anticipates three advantages to his proposal: (1) the return to holding money would equal the real return to the portfolio; (2) inflation would end; and (3) stability would increase.

Finally, Hall examines some foundations of macroeconomic doctrine on money and prices. He suggests that prices could be stabilized by establishing a bundle of resources as legal tender and defining the monetary unit in terms of the resource bundle. Alternatively, within a conventional system based on monetary reserves, the level of reserves could be manipulated so as to peg prices. In this connection, Hall notes the desirability of stabilizing the demand for reserves.

NBER research fellows Andrew Abel, Ben Bernanke, Robert Litterman, Jeffrey Sachs, and Lawrence Summers attended the program meeting, as did NBER research associates Martin Baily, Robert Barro, Alan Blinder, Rudiger Dornbusch, Martin Feldstein, Stanley Fischer, Jacob Frenkel, Benjamin Friedman, Robert Gordon, Zvi Griliches, Herschel Grossman, Paul Krugman, Bennett McCallum, Frederic Mishkin, Thomas Sargent, and John Taylor. Also participating were: Christopher Chamley, Yale University; William Haraf, Brown University; John Huizinga, University of Chicago; Yannis Ioannides, Boston University; Takatoshi Ito, University of Minnesota; and Julio Rotemberg, MIT.

Taxation Group Meets in February

Members and guests of NBER's Program in Taxation met in Cambridge on February 27 to discuss the following papers:

Lawrence H. Summers, NBER and MIT, "Inflation, Taxation, and Corporate Investment: A Q-Theory Approach"

Discussant: Patrick Hess, NBER and Ohio State University

Fischer Black, NBER and MIT, "When Is a Positive Income Tax Optimal?"

Discussant: Joseph E. Stiglitz, NBER and Princeton University

Martin Feldstein, NBER and Harvard University, "Tax Rates and Personal Saving"

Discussant: Patric Hendershott, NBER and Purdue University

David F. Bradford, NBER and Princeton University, "Issues in the Design of Saving and Investment Incentives"

Discussant: Alan Auerbach, NBER and Harvard University

Jerry Hausman, NBER and MIT, "Life-Cycle Savings Estimated from Panel Data"

Discussant: Daniel Feenberg, NBER

Summers's paper deals with the role of taxation and inflation in determining the market valuation of corporate capital and the level of investment. His results indicate that both tax policy and inflation have potent effects on the stock market and investment, but that these effects depend critically on whether or not policies are announced in advance.

Black's work presents a number of issues relating to the optimal mix of income and consumption taxes. His primary question is: Under what circumstances would levying an income tax be appropriate?

Feldstein's paper uses four different specifications for modeling the response of saving to rates of return. In all four cases, saving responds to changes in return. He further finds that real rates of return in the 1960s and 1970s fell due to increases in effective tax rates. Thus, high inflation, through the tax rate, reduces saving.

Bradford considers the problem of designing tax and related rules to promote capital formation. He divides saving and investment incentives into consumption tax treatments (for example, accelerated depreciation) and direct grants (such as the investment credit). Increasing the former leads to a convergence of savers' returns toward the social rate of return. The direct grant approach increases savers' returns but does not lead to their convergence with the social return.

Hausman examines the link between Social Security and saving and the validity of the life-cycle theory in the analysis. He finds that both Social Security and pension benefits influence an individual's planned wealth level at age 65, but not to as great an extent as previous studies have shown.

In addition to the authors and discussants, NBER research associates Roger H. Gordon, David Hartman, Laurence Kotlikoff, Charles E. McLure, Jr., Stewart C. Myers, Harvey Rosen, and Michael Rothschild participated in the meeting. NBER research fellows Don Fullerton and Joel Slemrod also took part in the day's activities, as did Robert Eisner of Northwestern University; Arnold Harberger of the University of Chicago, and Charles R. Hulten of The Urban Institute.

Conference Papers Available

The papers presented at four NBER conferences are now available as part of the Bureau's Conference Paper series. (See previous issues of the *Reporter* for a listing of other available Conference Papers.) They are issued, sometimes including a formal discussion of the paper, so that research findings can be conveyed quickly, even in cases where a conference volume will later be produced. Beginning in 1981, most papers presented at NBER con-

ferences and written by Bureau associates will become part of the Working Paper series rather than the Conference Paper series. Abstracts of these Working Papers appear in this or previous issues of the *Reporter.*

Individual copies of Conference Papers are available free of charge to corporate associates and other supporters of the National Bureau. Others can receive copies by sending $1.50 per copy to: Conference Papers, National Bureau of Economic Research, 1050 Massachusetts Avenue, Cambridge, MA 02138. Prepayment is required on orders totaling less than $10.00. Please use the following numbers when ordering papers:

Econometric Studies in Public Finance

(Some of these papers have been published in the October 1980 issue of the *Journal of Public Economics*, edited by David Bradford and Anthony Atkinson.)

CP 77. "On the Switch from Direct to Indirect Taxation," by Anthony B. Atkinson and Nicholas Stern in conjunction with Joanne Gomulka

CP 78. "Social Security and the Choice between Full-Time Work, Part-Time Work, and Retirement," by Anthony Zabalza, Christopher Pissarides, and M. Barton

CP 79. "International Differences in Social Security and Saving," by Martin Feldstein (NBER Working Paper No. 355)

CP 80. "An Econometric Model of Tenure Choice and Demand for Housing as a Joint Decision," by Mervyn King

CP 81. "Analysis of Re-Employment Probabilities for the Unemployed," by Tony Lancaster and Steven Nickell

CP 82. "The Social Security Earnings Test, Labor Supply Distortions, and Foregone Payroll Tax Revenues," by Anthony Pellechio

CP 83. "Labor Supply Responses to Tax Changes—A Simulation Exercise for the United Kingdom," by K. W. Glaister, A. McGlone, and D. Ulph

WP 409. "Taxation and the Stock Market Valuation of Capital Gains and Dividends: Theory and Empirical Results," by Roger Gordon and David Bradford

WP 513. "Market Wages, Reservation Wages, and Retirement Decisions," by Roger Gordon and Alan Blinder.

Economic Aspects of Health

(These papers have been submitted to the University of Chicago Press for publication consideration in a volume edited by Victor R. Fuchs.)

CP 84. "Prenatal Medical Care and Infant Mortality," by Jeffrey E. Harris, M.D.

CP 85. "The Behavior of Mothers as Inputs to Child Health: The Determinants of Birthweight, Gestation, and Rate of Fetal Growth," by Mark R. Rosenzweig and T. Paul Schultz

CP 86. "The Status of Health in Demand Estimation: Beyond Excellent, Good, Fair, and Poor," by Willard G. Manning, Jr., Joseph P. Newhouse, and John E. Ware, Jr.

CP 87. "Employment, Earnings, and Psychiatric Diagnosis," by Lee and Alexandra Benham

CP 88. "Children's Health Problems: Implications for Parental Labor Supply and Earnings," by David S. Salkever

CP 89. "Medical Care, Medical Insurance, and Survival Probability—The True Cost of Living," by Theodore C. Bergstrom

WP 539. "Time Preference and Health: An Exploratory Study," by Victor R. Fuchs

WP 609. "Physical Disabilities and Post-Secondary Educational Outcomes," by Robert A. Shakotko and Michael Grossman

WP 611. "Healthiness, Education, and Marital Status," by Paul Taubman and Sherwin Rosen

WP 612. "The Choice of Health Policies with Heterogeneous Populations," by Donald S. Shepard and Richard J. Zeckhauser

Inflation

CP 90. "The Ends of Four Big Inflations," by Thomas J. Sargent

CP 91. U.S. Inflation and the Choice of Monetary Standard," by Robert J. Barro

CP 92. "Inflation, Capital Taxation, and Monetary Policy," by Martin Feldstein

CP 93. "Public Concern about Inflation and Unemployment in the United States: Trends, Correlates, and Political Implications," by Douglas A. Hibbs, Jr.

CP 94. "Adapting to Inflation in the United States Economy," by Stanley Fischer

CP 95. "The Anatomy of Double-Digit Inflation in the 1970s," by Alan S. Blinder

Economics of Compensation

CP 96. "Fringe Benefits and the Costs of Changing Jobs," by Olivia S. Mitchell

CP 97. "Compensation Arrangements between Hospitals and Physicians," by Roger Feldman, Frank Sloan, and Lynn Paringer

CP 98. "The Effect of the Baby Boom on the Earnings Growth of Young Males," by Mark C. Berger

CP 99. "Layoff Unemployment, Risk Shifting, and Productivity," by Kenneth S. Chan and Yannis M. Ioannides

CP 100. "Pensions, Underfunding, and Salaries in the Public Sector," by Robert Stewart Smith

CP 101. "Firm-Specific Human Capital and Seniority Rules," by Lorne Carmichael

CP 102. "Estimating Preferences for Wage and Nonwage Benefits," by Stephen A. Woodbury

WP 623. "Wage-Employment Contracts," by Jerry Green

WP 624. "An Intertemporal Analysis of Taxation and Work Disincentives: An Analysis of the Denver Income Maintenance Experiment," by Thomas E. MaCurdy

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133. "An Innovation for Stable Real Retirement Income," by Zvi Bodie, 1980 (NBER Working Paper No. 442)

134. "The 'Overtaking' Point Revisited," by Charles Brown, 1980

135. "Inflation, Portfolio Choice, and the Prices of Land and Corporate Stock," by Martin Feldstein, 1980 (NBER Working Paper No. 526)

136. "The Optimal Tradeoff between the Probability and Magnitude of Fines," by A. Mitchell Polinsky and Steven Shavell, 1979

137. "Models of Long-Term Interest Rate Determination," by Benjamin M. Friedman and V. Vance Roley, 1980 (NBER Working Paper No. 205)

138. "Labor Supply, Uncertainty, and Efficient Taxation," by Jonathan Eaton and Harvey S. Rosen, 1980 (NBER Working Paper No. 388)

139. "Inventories in the Keynesian Macro Model," by Alan S. Blinder, 1980 (NBER Working Paper No. 460)

140. "Inflation, Tax Rules, and the Prices of Land and Gold," by Martin Feldstein, 1980 (NBER Working Paper No. 296)

141. "The Economics of Tax Policy toward Savings," by David F. Bradford, 1980

142. "Market Wages, Reservation Wages, and Retirement Decisions," by Roger H. Gordon and Alan S. Blinder, 1980 (NBER Working Paper No. 513)

143. "Income Tax Incentives to Promote Saving," by Charles Becker and Don Fullerton, 1980 (NBER Working Paper No. 487)

144. "The Effect of Wages, Taxes, and Fixed Costs on Women's Labor Force Participation," by Jerry A. Hausman, 1980

145. "The Distribution of the U.S. Capital Stock between Residential and Industrial Uses," by Martin Feldstein, 1981 (NBER Working Paper No. 448)

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A Disaggregated Structural Model of the Treasury Securities, Corporate Bond, and Equity Markets: Estimation and Simulation Results

V. Vance Roley
Technical Working Paper No. 7
December 1980
JEL No. 313

This paper presents the estimation and simulation results of a disaggregated structural model of U.S. security markets. The model consists of estimated demands for corporate bonds, equities, and four distinct maturity classes of Treasury securities, by eleven categories of investors. The model is closed with the addition of six market-clearing identities equating market demands with exogenous supplies. The empirical results provide support to the model's specification and indicate that the "within-sample forecasts" of the six endogenous security yields closely track historical data.

Multivariate Regression Models for Panel Data

Gary Chamberlain
Technical Working Paper No. 8
December 1980

Under stationarity, the heterogeneous stochastic processes are the nonergodic ones. I show that if a distributed lag is of finite order, then its coefficients are unconditional means of the underlying random coefficients. This result is applied to linear transformations of the process. The estimation framework is a multivariate wide-sense regression function. The identification analysis requires certain restrictions on the coefficients. The actual regression function is nonlinear, and so we provide a theory of inference for linear approximations. It rests on obtaining the asymptotic distribution of functions of sample moments. Restrictions are imposed by using a minimum distance estimator; it is generally more efficient than the conventional estimators.

The Superiority of Contingent Rules over Fixed Rules in Models with Rational Expectations

Willem H. Buiter
Technical Working Paper No. 9
January 1981
JEL No. 133

This paper investigates the robustness of the proposition that in stochastic models, contingent or feedback rules dominate fixed- or open-loop rules. Four arguments in favor of fixed rules are considered: (1) the presence of an incompetent or malevolent policy maker; (2) a trade-off between flexibility and simplicity or credibility; (3) the New Classical proposition that only unanticipated (stabilization) policy has real effects; and (4) the "time inconsistency" of optimal plans in noncausal models, that is, models in which the current state of the economy depends on expectations of future states. The main conclusion is that the "rational expectations revolution," represented by arguments (3) and (4), does not affect the potential superiority of (time inconsistent) closed-loop policies over (time inconsistent) open-loop policies. The case against conditionality in the design of policy must therefore rest on argument (1) or (2), either of which predates the New Classical macroeconomics.

Granger-Causality and Stabilization Policy

Willem H. Buiter
Technical Working Paper No. 10
March 1981
JEL No. 130

This paper aims to provide a stochastic, rational expectations extension of Tobin's "Money and Income; Post Hoc Ergo Proper Hoc?" It is well known that money may "Granger-cause" real variables even though the joint density function of the real variables is invariant under changes in the deterministic components of the monetary feedback rule. The paper shows that failure of money to Granger-cause real variables does not preclude its having a stabilization role. In a number of examples, the conditional second moment of real output is a function of the deterministic components of the monetary feedback rule. Yet money fails to Granger-cause output ("in mean" and "in variance"). In all of these models, money is a pure stabilization instrument; superneutrality is assumed. If the analysis is extended to "structural" or "allocative" instruments, such as fiscal instruments, the conclusion is even stronger. Failure of these policy instruments to Granger-cause real variables is consistent with changes in the deterministic parts of the policy feedback rules being associated with changes in the conditional means of the real variables.

Granger-causality tests are tests of "incremental predictive content." They convey no information about the invariance of the joint density function of real variables under changes in the deterministic components of policy feedback rules.

Two-Step, Two-Stage Least Squares Estimation in Models with Rational Expectations

Maurice Obstfeld, Robert Cumby, and **John Huizinga**
Technical Working Paper No. 11
March 1981
JEL No. 210

This paper introduces a limited-information, two-step estimator for models with rational expectations and serially correlated disturbances. The estimator greatly extends the area of applicability of McCallum's (1976) instrumental variables approach to rational expectations models.

Section I reviews McCallum's method and discusses in detail the problems surrounding its use in many empirical contexts. Section II presents the two-step, two-stage least squares estimator (2S2SLS) and demonstrates its efficiency relative to that of McCallum (1979). Section III provides a comparison of several estimators for a two-equation macroeconomic model with rational expectations due to Taylor (1979).

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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 December 1980 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.

Inflation, Taxation, and Corporate Investment: A *Q* Theory Approach

Lawrence H. Summers
Working Paper No. 604
December 1980
JEL No. 323

This paper examines the role of taxation and inflation in determining the market valuation of corporate capital and the level of investment. It extends previous work on

the q theory of investment by incorporating the effects of taxes levied at the individual level and by focusing on the impact of inflation. The q theoretic approach makes it possible to study the effects of policy announcements and of temporary policies. The resulting model of the investment process is immune from the "Lucas critique." The estimated relationships are technological and independent of the choice of policy rule.

The empirical results indicate that tax policy and inflation have potent effects on both the stock market and investment. These effects depend critically on whether or not policy is announced in advance. Simulations based on q investment equations indicate that an increase in the rate of inflation from 0 to 8 percent would cause an immediate 23 percent decline in the stock market, and a 35 percent increase in the capital stock. Changes in tax policy also have a large effect. The estimated speed of adjustment of the capital stock is surprisingly slow, with less than half of the adjustment occurring within ten years following typical shocks.

Tax Policy and Corporate Investment

Lawrence H. Summers
Working Paper No. 605
December 1980
JEL No. 323

This paper gives an overview of the issues connected with proposals to spur investment using tax incentives. There are four main conclusions:

1. The rate of net capital formation in the United States has declined very substantially. This decline has been associated with a sharp fall in the aftertax return to investors in the corporate sector.
2. Increasing the share of output devoted to the formation of business capital would not have a large effect on the rate of growth of productivity, inflation, or employment. However, it would contribute substantially to intertemporal economic efficiency. The welfare gains achievable through investment incentives approach $100 billion.
3. Measures to spur investment are likely to have substantial effects. The lags are, however, very long. For example, it is estimated that the elimination of taxes on capital gains would raise the capital stock by 29 percent in the long run, but by only 4 percent within five years.
4. Through judicious design of tax policy, it is possible to spur investment with only a small revenue cost. It is crucial to take account of the effect of anticipated policy on the level of investment. Traditional Keynesian econometric approaches are ill-suited to this goal.

Inflation, the Stock Market, and Owner Occupied Housing

Lawrence H. Summers
Working Paper No. 606
December 1980
JEL Nos. 311, 323

This paper offers an explanation for the sharp decline in the value of the stock market and the increase in the price of owner occupied housing over the last decade. Both result from the interaction of increases in the rate of expected inflation and the U.S. tax system. Increases in inflation substantially raise the tax burden on corporate capital because of historic cost depreciation, FIFO inventory accounting, and the taxation of nominal capital gains. This increase in the effective tax rate is capitalized into an immediate decline in the price of corporate capital, and an increase in the price of its substitute-housing capital.

The results in this paper indicate that tax effects are large enough to account for almost the entire shift in relative prices that has been observed. Some preliminary empirical evidence on the relation between inflation and asset prices supports the theoretical predictions. This suggests that in the long run, inflation may have a very large impact on the composition of the capital stock.

Does Purchasing Power Parity Work?

Michael R. Darby
Working Paper No. 607
December 1980
JEL No. 400

The logarithm of the purchasing power ratio (PPR) is shown, for seven countries and three alternative price indexes, to follow a stationary and invertible process in the first differences. This means that permanent shifts in the parity value accumulate over time. Therefore, as the prediction interval lengthens, the variance of the level of the PPR goes toward infinity while the variance of its average growth rate goes to zero. Since the variance of the permanent shifts is substantial, the following two conclusions can be drawn. (1) Harmonized money growth cannot maintain constant exchange rates; feedback of reserve flows is required. (2) Economic explanations of the permanent shifts are an important research topic.

On Functions, Quality, and Timeliness of Economic Information

Victor Zarnowitz
Working Paper No. 608
December 1980
JEL Nos. 130, 220

The flow of production and the use of economic information consist of the collection and processing of primary data, the reporting of the resulting measures, and the transformation of the latter into signals or messages that presumably add to knowledge or aid decision making. Each stage contributes to the returns and costs, quality and errors of the information. The processes involved on the micro and macro levels show important similarities and interactions.

The uncertainty inherent in economic information increases with the probability of errors in the underlying data and their processing and interpretation. Many errors cannot be promptly detected and eliminated but can be reduced gradually over time, as attested by the revisions in economic statistics.

This paper presents substantial evidence on the accuracy of provisional estimates of quarterly and monthly changes in eighteen important variables. Measures of several aspects of data quality and of average lags of data release and signal detection are provided for a collection of 110 widely used economic indicators. These materials help identify the location of the more serious measurement errors by variable and period, and they show that frequently information lags five or more months.

The errors and lags of information may lead to apparently "systematic," but not readily detectable and removable, errors in expectations. This is likely to happen, in particular, in times of great surprises and shocks, when measurement of short-term changes in the economy is most difficult and current signals are often misread. Some illustrations are drawn from the events of 1970–75.

Physical Disabilities and Post-Secondary Educational Outcomes

Robert A. Shakotko and **Michael Grossman**
Working Paper No. 609
December 1980
JEL No. 913

This paper is an empirical investigation of the effect that poor health early in the life cycle has on post-secondary educational choices and outcomes. We use panel data for a sample of 10,430 individuals who were high school seniors in the spring of 1972, and who were surveyed again in October of each year through 1976. Various health information was collected in the base year of the survey, and we use these base year reports as measures of health that are predetermined with respect to educational behavior in the subsequent five years. We examine individuals' choices of post-secondary activities (which include different types of post-secondary education and no post-secondary education at all), and the rate at which individuals leave educational activities, in an effort to determine if the behavior of disabled individuals differs from that of healthy individuals, and if these differences could be attributable to health problems.

Income and Payroll Tax Policy and Labor Supply

Jerry A. Hausman
Working Paper No. 610
December 1980
JEL Nos. 821, 822

This paper considers both theoretical questions and empirical measures of the effects of various policies of income and payroll taxation on labor supply. It emphasizes deadweight loss as the correct criterion for evaluating taxation, rather than merely output effects. Distributional issues are also discussed. Simulations are done for the Kemp–Roth tax reform proposals to calculate both revenue effects and changes in deadweight loss. Deadweight loss calculations are also done for an equal yield, progressive, linear income tax.

Healthiness, Education, and Marital Status

Paul J. Taubman and **Sherwin Rosen**
Working Paper No. 611
January 1981

In this paper, we use data from the Retirement History Survey (RHS) to examine the relationship of some socio-demographic and economic variables to morbidity and mortality. Since the RHS is a longitudinal survey, we are able to study current health conditioned on prior health as well as the more usual unconditioned estimates of health. We find that health is related to education and marital status, although the marital effects are much weaker when we take prior health into consideration. Marital effects persist when we control for income and for use of medical facilities. An interesting finding is that married men seem to live longer with poor health than single men.

The Choice of Health Policies with Heterogeneous Populations

Richard J. Zeckhauser and **Donald S. Shepard**
Working Paper No. 612
January 1981
JEL Nos. 913, 815, 213

Deciding whether to fund a given health program involves both statistical and ethical issues. Traditional statistical methods of measuring a program's effectiveness may give misleading results unless careful attention is paid to heterogeneity of the population. Even within

particular age and sex categories, members of a population typically differ in both their mortality rate and the extent to which they would benefit from a given medical intervention. It may or may not be possible to identify the risk factors (for example, weight or smoking behavior) that explain these differences.

If an intervention benefits different risk groups unequally, then over time, it will change their proportion within the population. If those helped most are those at greatest risk, a "traditional assessment" will overstate the benefits of intervention. Greater accuracy can be achieved through a "standardized assessment," which calculates the benefits of intervention separately for each distinctive risk group of the population. For example, a traditional assessment of pneumococcal pneumonia vaccine probably overstates the program's benefits and underestimates its costs. Failure to recognize heterogeneity in the population also creates pitfalls in interpreting the results of clinical trials of new drugs (as illustrated by the example of sulfinpyrazone).

As more sophisticated statistical methods improve our understanding of the benefits of different programs, they will also raise ethical problems. Use of a standardized assessment, for instance, may make it clear that it is cost-effective to give an intervention to certain groups (for example, nonsmokers or the elderly) but not others. Considering this problem from an "original position" may reveal an ethically acceptable basis for making such decisions on efficiency. We believe that if people were unaware of which risk group they themselves would fall into, they would elect to allocate resources according to the principle of cost-effectiveness.

Is the Maximum Tax on Earned Income Effective?

Lawrence B. Lindsey
Working Paper No. 613
January 1981
JEL No. 323

The Tax Reform Act of 1969 included a provision intended to set at 50 percent the tax rate on all personal service income above the 50-percent-bracket amount. The current law fails to meet this objective for the vast majority of these taxpayers. This paper explains why the current law is ineffective, simulates our current experience with the law using the National Bureau of Economic Research TAXSIM model, and considers options to the present law.

Asset Holdings and the Life Cycle

Mervyn A. King and **Louis Dicks-Mireaux**
Working Paper No. 614
January 1981
JEL Nos. 915, 920

Empirical studies of the model of life cycle savings have tended to reject the hypothesis of a "hump-shaped" pattern for the wealth–age profile. Using new data on net worth for 12,734 families, and controlling for differences in permanent income and sample selection bias, we show that wealth declines after retirement. The estimated rates of decline in wealth are consistent with a life cycle model in which there is uncertainty about the date of death.

Variations in Infant Mortality Rates among Counties of the United States: The Roles of Social Policies and Programs

Michael Grossman and **Steven Jacobowitz**
Working Paper No. 615
January 1981
JEL No. 913

The purpose of this paper is to shed light on the causes of the rapid decline in the infant mortality rate in the United States in the period after 1963. We consider the roles of four social policies: Medicaid, subsidized family planning services for low-income women, maternal and infant care projects, and the legalization of abortion. The most striking finding is that the increase in the legal abortion rate is the single most important factor in reductions of both white and nonwhite neonatal mortality rates. Not only does the increase of abortion dominate the other social policies, but it also dominates schooling and income.

The Elusive Incidence of the Corporate Income Tax: The State Case

Charles E. McLure, Jr.
Working Paper No. 616
January 1981
JEL No. 320

A recurring theme in the literature on taxation has been uncertainty about the incidence of the corporate income tax. The answer may be even more elusive for state than for federal taxes. As seen by one state, a corporate income tax levied on the basis of a formula that apportions total income is a composite of taxes levied on whatever factors enter the state's apportionment formula. Such a tax is likely to be borne primarily by residents of the taxing state, as consumers, immobile workers, and owners of land and immobile capital. Substantial shifting of the tax to consumers or capitalists throughout the nation is unlikely.

Black-White Earnings Ratios since the Civil Rights Act of 1964: The Importance of Labor Market Dropouts

Charles Brown
Working Paper No. 617
January 1981
JEL No. 917

Previous analyses of postwar black-white earnings ratios have found a more rapid rate of increase in the period since 1964 than before. The reason for this acceleration is unresolved. One view is that federal equal employment activities have increased the relative demand for black labor. An alternative view is that rising relative earnings reflect (1) reductions in relative supply and (2) the "statistical" effect of low earners withdrawing from the labor market, thus raising median earnings.

This study differs from previous work on the subject in two ways. First, there is an explicit discussion of the restrictions on the universe from which published data on median earnings by race are calculated. The restriction most commonly addressed in previous work (having positive earnings in the year in question) is found to be less important than an undiscussed restriction (being employed as a wage-and-salary worker the following March). Second, data on the distribution of earnings are used to determine the effect of labor market dropouts on median earnings, instead of trying to estimate this effect (as well as demand and supply effects) from time-series data. This permits comparison of "corrected" and "uncorrected" post-1964 trends.

For males, about half of the "uncorrected" trend remains after the relative earnings variable is corrected for labor market withdrawals. For females, between half and four fifths remains.

The Role of Seniority at U.S. Work Places: A Report on Some New Evidence

James L. Medoff and **Katharine G. Abraham**
Working Paper No. 618
January 1981
JEL No. 824

This study discusses newly collected data concerning the role played by seniority in U.S. firms' decisions about termination and promotion. The new information, based on 561 usable responses to a nationwide survey conducted by the authors, sheds light on two key questions: (1) For what percentage of U.S. private sector employees (outside of agriculture and construction) is seniority per se (that is, seniority independent of current performance) rewarded in promotion decisions? and (2) For what percentage does protection against job loss grow with seniority even when current value to the firm does not?

While there appear to be important differences for hourly versus salaried employees and for those covered by collective bargaining versus those not so covered, the new evidence presented strongly supports the claim that seniority, independent of productivity, plays a major role in the compensation and termination decisions affecting all employee groups at most U.S. workplaces.

Social Security, Bequests, and the Life Cycle Theory of Saving: Cross-Sectional Tests

Alan S. Blinder, Roger H. Gordon, and **Donald E. Wise**
Working Paper No. 619
January 1981
JEL Nos. 920, 915

This paper studies the asset holdings of white American men near retirement age. Assets as conventionally defined show no tendency to decline with age, in apparent contradiction to the life cycle theory of saving. However, a broadened concept of assets that includes expected future pension benefits (both public and private) and expected future earnings ("human wealth") does decline more or less as predicted by the theory. No matter how they are defined, assets are a decreasing function of the number of children—which casts doubt on the strength of the bequest motive. Finally, financial assets and social security wealth fail to exhibit the inverse relationship suggested by Feldstein's displacement hypothesis.

To investigate these issues econometrically, an equation for assets is developed from the strict life cycle theory. The specification is generalized to allow for (1) a bequest motive, proxied by the number of children; (2) displacement of private wealth by Social Security wealth that is not exactly dollar for dollar; (3) a level of consumption late in life that differs systematically from what the strict life cycle theory implies.

The equation is estimated by nonlinear least squares on a rich cross-sectional data set containing over 4300 observations. The results show that the life cycle model has little ability to explain cross-sectional variability in asset holdings. The model's key parameters are poorly identified, despite the large sample size and considerable cross-sectional variation in most variables. According to the estimates, consumption late in life is, on average, only about half of what the strict life cycle theory predicts; each dollar of social security wealth displaces about $0.39 (with a large standard error) of private wealth; and the bequest motive, while present, is quite weak.

Inventories and Sticky Prices: More on the Microfoundations of Macroeconomics

Alan S. Blinder
Working Paper No. 620
January 1981
JEL Nos. 022, 023

The role of inventories in making prices "sticky" is studied by analyzing a dynamic, linear-quadratic model of a monopoly firm facing stochastic demand but able to store its finished goods in inventory. It is shown that in

contrast to the usual presumption, firms that exhibit the smallest output responses to demand fluctuations may also exhibit the smallest price fluctuations. Specifically, firms that have very flexible inventory storage facilities or are subjected to very transitory demand shocks will rely on inventories as buffers and will change neither production nor price very much. On the other hand, firms that have very inflexible storage facilities or whose demand shocks are quite permanent will display large swings in both price and output.

The standard assumption about inventory carrying costs that has been used in the literature (that they are linear) is shown to imply that production is impervious to fluctuations in demand. It is also established that prices may respond more strongly to positive demand shocks than to negative ones if it is impossible to hold negative inventories (that is, to have unfilled orders).

The model offers an explanation for "stickiness" in relative prices. However, under certain circumstances, it may help explain the persistence of inflation.

Output Fluctuations and Gradual Price Adjustment

Robert J. Gordon
Working Paper No. 621
January 1981
JEL Nos. 023, 131, 311

The phenomenon of gradual price adjustment is at the heart of aggregate fluctuations in output and employment and of the related debate over activist stabilization policy to control such fluctuations. In the past decade, explanations of price adjustment within a non-market-clearing setting have competed for attention with the "new classical equilibrium macroeconomics" based on universal auction markets and instant price responsiveness. This paper provides a critique of both paradigms and makes some suggestions for merging the more convincing elements of each.

The paper argues that the most fundamental aspect of market arrangements, recognized since Adam Smith, is pervasive heterogeneity across time, space, and products, leading to specialization and decentralized decision making, as well as to a complex input-output network of relations among specialized firms. Attempts to explain gradual price adjustment for these firms must start from the fact that they are generally price setters rather than price takers, since markets with previously set prices and freely chosen transaction locations and times are more efficient for many products than centralized auction markets with instantly responsive prices and previously set transaction locations and times.

A model is developed that explains the varying degree of price responsiveness observed in historical episodes by considering the inference problem of a price-setting firm that faces price-setting suppliers, and that recognizes a distinction between shocks to aggregate demand and an independent set of local shocks experienced by itself and its suppliers. Its product price responds more completely to aggregate demand shocks when the variance of those aggregate shocks is perceived to be large relative to that of the independent local shocks, as is likely to occur during a wartime situation or a hyperinflation.

The Real Interest Rate: An Empirical Investigation

Frederic S. Mishkin
Working Paper No. 622
January 1981
JEL Nos. 131, 134

This paper empirically explores movements in real interest rates in the United States over the last fifty years. It focuses on several questions that have repeatedly arisen in the literature. How valid is the hypothesis that the real rate of income is constant? Does the real rate decline with increases in expected inflation? Are cyclical movements in real variables correlated with movements in real rates? How reliable is the Fisher effect where nominal interest rates reflect changes in expected inflation? Does monetary policy affect the real return to saving, with the resulting nonneutral effect on capital formation and productivity? What kind of variation in real interest rates have we experienced in the last fifty years? Have real rates turned negative in the 1970s as is commonly believed, and were they unusually high in the initial stages of the Great Depression?

In pursuing these questions, this paper outlines the methodology and theory used in the empirical analysis. The results indicate that contrary to Fama's finding, there are significant movements in the real rate in both the prewar and postwar period. In particular, there is a significant negative correlation between inflation and the real interest rate, and real rates appear to have been unusually high during the contraction phase of the Great Depression, while unusually low in the high inflation 1970s. The results do not pick up significant correlations between real interest rates and any of the real variables tested. However, the failure to find these correlations is likely to be the result of small cyclical variation of real rates rather than the absence of relationships between real variables and real rates.

Wage-Employment Contracts

Jerry Green
Working Paper No. 623
January 1981
JEL No. 821

This paper studies efficient agreements about the dependence of workers' earnings on employment when the employment level is controlled by firms. Under plausible assumptions, such agreements will cause employment to diverge from efficiency as a by-product of their

attempt to mitigate risk. However, employment is above rather than below the efficient level when the conditions of profitability are worse than average. Such a one-period implicit contracting model cannot, therefore, be used to "explain" unemployment as it is traditionally conceived.

An Intertemporal Analysis of Taxation and Work Disincentives: An Analysis of the Denver Income Maintenance Experiment

Thomas E. MaCurdy
Working Paper No. 624
January 1981

This paper formulates an empirical model of consumption and labor supply that explicitly incorporates income taxes in a multiperiod setting. The model relies on few assumptions and provides a robust framework for estimating parameters needed to predict the response of consumption and hours of work to changes in a consumer's constraints on lifetime resources. The empirical specifications developed here apply when a consumer is uncertain about future prices, taxes, income, and tastes. The estimation of these specifications does not require explicit modeling of either the expectations or the history of a consumer. The empirical model accommodates both progressive and regressive tax schemes. Estimation of the model involves no complicated procedures; a full set of parameter estimates can be obtained with the application of standard two-stage least-squares techniques. The final section of this paper estimates a particular specification of the model using data from the Denver Income Maintenance Experiment. The empirical formulations proposed here are particularly well suited to deal with the kinds of tax schemes used in NIT experiments and the limited duration of those programs.

Explanations of Exchange Rate Volatility and Other Empirical Regularities in Some Popular Models of the Foreign Exchange Market

Robert P. Flood
Working Paper No. 625
January 1981
JEL No. 430

This paper is intended to accomplish two tasks. First, exchange rate models with sticky prices and flexible prices are checked for their consistency with two key empirical regularities: (1) the observed pattern of volatility of price level versus exchange rate and (2) the observed pattern of volatility of spot versus forward exchange rates. Second, a widely neglected reason for exchange rate volatility, activist monetary policy, is studied.

It is found that both sticky price and flexible price models explain the empirical regularities rather well. Further, if prices are sticky it is found that exchange rate overshooting may be empirically nontrivial.

A Model of Stochastic Process Switching

Robert P. Flood and **Peter M. Garber**
Working Paper No. 626
January 1981
JEL Nos. 430, 020

In this paper, we develop a rational expectations model of exchange rates that is capable of explicitly confronting agents' beliefs about a future switch in exogenous driving processes. In our setup, the agents know with certainty both the initial exogenous process and the new process to be adopted when the switch occurs. However, they do not know with certainty the timing of the future switch, as it depends on the path followed by the (stochastic) exchange rate.

The model is discussed in terms of the British return to prewar parity, in 1925. However, our results are applicable to a variety of situations where process switching depends on the motion of a key endogenous variable.

The Adequacy of Savings

Laurence Kotlikoff and **Lawrence H. Summers**
Working Paper No. 627
January 1981
JEL No. 915

This paper uses newly available data from the Social Security Retirement History Survey to examine the adequacy of savings. This data source is particularly rich; survey data on respondents covering six years have been matched with Social Security earnings records dating back twenty-five years. In addition to information on the path of lifetime earnings, the survey contains extensive data on asset holdings.

The results indicate that only a very small minority of couples face significant reductions in their standard of living during old age. This appeared to be due in large part to compulsory savings institutions such as Social Security and private pensions.

If Social Security were eliminated and not replaced by private accumulation, a large fraction of the aged population would face a very sharp decline in living standards. Econometric evidence presented in the final section of this paper indicates that persons receiving more Social Security benefits have relatively higher levels of sustainable consumption at retirement.

Trade Policy and Import Competition under Fluctuating Prices

Paul Strebel and **Shabtai Donnenfeld**
Working Paper No. 628
January 1981

When subsidies and tariffs are applied to imports with fluctuating prices, it is shown that the output response of domestic producers depends on market structure and

attitude toward risk. The domestic industry response is contrasted under two types of market structure, a monopoly and a competitive industry. Some unanticipated results suggest caution in the implementation of trade policy.

The Real Price of Oil and the 1970s World Inflation

Michael R. Darby
Working Paper No. 629
February 1981
JEL No. 134

This paper shows that the effects on real income and the price level of the 1973–74 oil price increase are quite ambiguous on both theoretical and empirical grounds. The theoretical analysis reviews standard results and extends them to analyze the steady-state equilibrium and endogenous monetary policy reaction functions. It is shown that standard models and parameter values imply trivial reductions in real income and ambiguously signed changes in the price level. It is noted, however, that other special models can rationalize empirical findings of large effects. Direct real oil price effects in an extended Barro–Lucas real income equation are estimated for eight countries. Although statistically significant and substantial direct effects are found for about half the countries, it is noted that these coincided with countries undergoing price decontrol during 1973–74. Thus price control biases in real GNP data provide an acceptable alternative explanation for the estimated effects. Simulation experiments in an international model illustrate the wide range of real income and price level effects that are consistent with the data. Further research is proposed to narrow the range of possible effects.

Monetarist Principles and the Money Stock Growth Rule

Bennett T. McCallum
Working Paper No. 630
February 1981
JEL No. 130

The main purpose of this paper is to reconsider two antimonetarist "messages" that have been prominent in recent writings on that doctrine. One of these claims, that economies are likely to be unstable if a constant money growth rule is applied, together with noncyclical fiscal behavior, is followed. The second suggests that long-run effects of government deficits on aggregate demand are stronger when financed by bonds than when financed by money. I argue here that support for the second message relies upon an unjustified presumption of stability in certain macro models when the appropriate conclusion is that instability prevails under the constant money growth rule. But the instability conclusion is also misleading as it depends upon an assumed absence of economic growth. Thus, neither message has analytical justification. This paper also stresses the importance of the hypothesis of the natural rate of unemployment for monetarist policy proposals and argues that some currently popular supply formulations are inconsistent with that hypothesis.

When Is a Positive Income Tax Optimal?

Fischer Black
Working Paper No. 631
February 1981

When will the optimal mix of a constant income tax with a constant consumption tax involve a positive income tax? The assumptions of the model in which this question is asked include: (1) identical individuals with coincident lifetimes who work in every period; (2) initial endowments of physical capital; (3) fixed government expenditures; and (4) government borrowing (or lending) that goes to zero when the world ends. In a model like this, we can ignore the transition problem. If we allow the constant tax on income from capital and the constant tax on wage income to be at different rates, we can ask a further question. When will the optimal mix of all three taxes (including the consumption tax) involve a positive tax on either income from capital or wage income?

Self-Selection and Pareto Efficient Taxation

Joseph E. Stiglitz
Working Paper No. 632
February 1981
JEL No. 022

This paper analyzes a set of the Pareto efficient tax structures. By formulating the problem in terms of self-selection, I show more clearly the similarity between this and a number of other problems (such as optimal pricing of a monopolist) that have recently been the subject of extensive research, and I derive a number of new results. I establish the following points. (1) Under fairly weak conditions, randomization of tax structures is desirable. (2) If different individuals are not perfect substitutes for one another, then the general equilibrium effects—until now largely ignored in the literature—of changes in the tax structure may be dominant in determining the optimal tax structure. In particular, if the relative wages of individuals with high ability and low ability depend on the relative supplies of labor, then the optimal tax structure entails a negative marginal tax rate on the high ability individuals and a positive marginal tax rate on the low ability individuals (the magnitude of which depends on the elasticity of substitution). (3) If individuals differ in their preferences, then Pareto efficient taxation may entail negative marginal tax rates for high incomes. (4) If wage income is stochastic, the marginal tax rate at the upper end may be 100 percent.

My analysis thus makes clear that the main qualitative properties of the optimal tax structure to which earlier studies called attention are not robust to these attempts to make the theory more realistic.

The Impact of Unions on the Labor Market for White and Minority Youth

Harry S. Holzer
Working Paper No. 633
February 1981
JEL No. 824

This paper presents estimates of the effects of unions on the wages and employment of young black and white males who are both union and nonunion workers. It also presents estimates of their union membership rates. While unions have a very substantial, positive effect on the wages of young union workers, particularly young blacks, they have a negative effect on the wages of young blacks who are not unionized.The effects of unions on employment are negative for both groups and especially for blacks.

As for the relative access to unionized employment, young blacks within the labor force have membership rates that are roughly comparable to those of young whites. However, rates for young blacks appear to be somewhat lower after accounting for differences in labor force participation between young blacks and whites. Young blacks also continue to be underrepresented in the crafts and construction industries, which are heavily unionized, while being overrepresented in the relatively nonunionized, low wage service sector. These results suggest that increasing the access of young blacks to unionized employment would improve their positions in the labor market.

Involuntary Terminations under Explicit and Implicit Employment Contracts

James L. Medoff and **Katharine G. Abraham**
Working Paper No. 634
February 1981

This study investigates where and when last-in-first-out permanent layoff policies coincide with compensation policies under which the net value of senior workers appears to be less than that of their junior peers. The investigation relies upon both the responses to our survey of U.S. firms and on microdata from the computerized personnel files of a major U.S. corporation. Our findings for U.S. companies outside of agriculture and construction lead us to the following three conclusions. (1) For most employees, it appears that protection against job loss grows with seniority, although net value to the firm does not. (2) While a very sizable percentage of nonunion workers may be covered by implicit employment contracts that give more protection against termination to those with more seniority, a much higher percentage of workers covered by collective bargaining agreements seem to enjoy such protection. (3) The job protection afforded senior nonunion personnel, especially exempt employees, appears to be less strong than that provided to union members.

Process Consistency and Monetary Reform: Further Evidence and Implications

Robert P. Flood and **Peter M. Garber**
Working Paper No. 635
February 1981

In this paper, we provide additional evidence that process consistency may have materialized as a restrictive constraint on the money generation process. In addition to recomputing the time series of process consistency probabilities using new data from the German case, we apply our empirical technique to the data from the other hyperinflations studied by Cagan. We interpret our results as evidence bearing on the type of transversality condition studied by Brock, or Brock and Scheinkman, as a condition sufficient to ensure a unique equilibrium in optimizing models with perfect foresight and money.

On the Predictability of Tax Rate Changes

Robert J. Barro
Working Paper No. 636
February 1981

Some previous analyses have suggested that the smoothing of tax rates over time would be a desirable guide for public debt management. One implication of this viewpoint is that future changes in tax rates would be unpredictable based on current information. I test this proposition by examining the behavior of U.S. federal and total government tax (and "nontax") receipts relative to GNP. The sample for the federal government goes back to 1879, while that for total government starts in 1929. I also discuss some econometric problems with using time-averaged data. The main empirical results accord with the theoretical analysis; in particular, there is: (1) little indication of drift in the tax rates; (2) insignificant relations of tax rate changes to the own history of changes; (3) little explanatory value for tax rate changes from a vector of lagged variables, which include the behavior of government spending and real output. If the findings are sustained, they imply that the existing U.S. time-series data do not isolate periods in which current overall tax rates would be perceived as high or low relative to expected future rates. Accordingly, it may be impossible to use these data to evaluate policies that entail intertemporal manipulation of aggregate tax rates.

Issues in the Design of Saving and Investment Incentives

David F. Bradford
Working Paper No. 637
February 1981
JEL Nos. 321, 323

This paper examines the characteristics of and interactions among saving and investment incentives (S-I incentives) in the context of an income tax system that is inadequately indexed for inflation. Examples of incentives include more rapid depreciation of buildings and equipment and exemption of larger amounts of interest income. S-I incentives are classified into "consumption tax" and "direct grant" types, and it is shown that these differ in their influence on portfolio choices, in their sensitivity to inflation, and in the design problems they present. I stress requirements for neutrality with respect to asset durability and portfolio composition. One new result derived in the paper is the reduction in interest taxation that would yield neutrality in the presence of partial expensing of real investment or an equivalent investment incentive.

Accelerating Inflation, Technological Innovation, and the Decreasing Effectiveness of Banking Regulation

Edward J. Kane
Working Paper No. 638
March 1981
JEL No. 311

This paper attempts to explain the decreasing effectiveness of traditional regulatory restraints on the capacity of individual U.S. banks for gathering deposits and taking over other firms. It also discusses why opportunities for deregulating banking markets were finally seized in 1980.

The explanation proceeds within the framework of the *regulatory dialectic*. This concept envisages an alternating interplay of action and reaction between political processes of regulation and economic processes of avoidance by those being regulated.

In explaining the evolution of U.S. deposit institutions and markets in the 1960s and 1970s, the paper feeds into the regulatory dialectic assumptions about the objectives of federal banking regulation and about outside forces that disturb the adjustment process. The disturbing, exogenous forces are: (1) accelerating change in the technological and market environment of commercial banking and (2) increasing uncertainty concerning the future speed of environmental change. Differences between incentive structures in the private sector and government suggest that, in the face of environmental changes, the adaptive efficiency shown on average by managers of deposit institutions should be greater than that shown by managers of the several competing banking agencies. Incorporating this differential, adaptive capacity into the regulatory dialectic helps to explain how increases in the pace of environmental change and in the degree of environmental uncertainty led regulatee responses to come more quickly and the regulatory responses to come more slowly. The bottom line is that when the environment changes rapidly and becomes uncertain, traditional forms of U.S. banking regulation can be overwhelmed by technological and regulation-induced innovation.

Nested Tests of Alternative Term-Structure Theories

Edward J. Kane
Working Paper No. 639
March 1981
JEL No. 311

Controversies in the theory of term structure center around the existence and variability of term premiums in securities yields. In this paper, the term premium on a default-free, n-period bond is defined as the difference between its observable yield to maturity and the average, *expected* per annum rate of return on an n-period strip of rollover investments in one-period bonds. To test alternative term structure theories without introducing ex post proxies for expectational variables, this paper uses a set of cross-section interest rate forecasts (collected jointly with Burton Malkiel of Princeton University and NBER) from a population of large institutional lenders at four different phases of a single interest rate cycle. Statistical tests strongly confirm the existence of nonzero term premiums at each survey date, thereby rejecting the pure-expectations theory of the term structure. Additional tests are unable to reject restrictions implied by the liquidity premium hypothesis: that term premiums should be positive and increase with maturity. Finally, contrary to the martingale hypothesis, ex ante term premium data vary significantly over time and show a positive association with the level of interest rates.

Deregulation, Savings and Loan Diversification, and the Flow of Housing Finance

Edward J. Kane
Working Paper No. 640
March 1981
JEL No. 311

This paper assesses the probable impact of the Depository Institutions Deregulation and Monetary Control Act of 1980 on S and Ls' profitability and participation in mortgage markets. It tracks inflation-induced secular declines in the value of S and L mortgage holdings between 1965 and 1979 and argues (contrary to conventional wisdom) that deposit-rate ceilings proved no more

than a minor and temporary source of help to S and Ls. Analysis presented shows that Federal Savings and Loan Insurance Corporation guarantees, not deposit rate ceilings, kept the industry afloat in recent years.

Further analysis centers on federal and state restrictions on S and L loan opportunities and on mortgage lenders' ability to design and to price mortgage instruments for an environment marked by accelerating inflation and increasing inflation uncertainty. Since S and Ls were free to raise whatever amount of funds they wished through large certificates of deposit, restrictions on S and L lending opportunities had to be responsible for the widely publicized bouts of disintermediation these institutions suffered near post-1965 business cycle peaks.

Foreign Takeovers of Swedish Firms

Robert E. Lipsey and **Birgitta Swedenborg**
Working Paper No. 641
March 1981
JEL Nos. 441, 442

By analyzing foreign takeovers, we can distinguish between the characteristics of firms and industries that encourage takeovers and the effects of foreignness or of takeovers per se on those firms and industries.

Foreigners have tended to take over only the Swedish firms that are of above average size within each industry. Very few takeovers occur among the smallest firms, those with fewer than 20 employees or even those with fewer than 200 employees. However, the firms taken over are not large compared to most Swedish companies of over 200 employees. In fact, they are well below average size within that group.

The firms taken over are more skill-oriented or technology-oriented than Swedish-owned firms in the same industries. However, takeovers are not particularly prevalent in industries in which firms in general are large, skill-oriented, or technology-oriented. Thus, the selection of firms for takeover is based on firm characteristics, not industry characteristics. After takeover by foreigners, firms grow somewhat faster than Swedish-owned firms in the same industries. The technological characteristics of the firms, by the crude measurements we have been able to apply so far, do not seem to be affected in any consistent way by takeover.

The Relation between Vocational Training in High School and Economic Outcomes

Alan L. Gustman and **Thomas L. Steinmeier**
Working Paper No. 642
March 1981
JEL No. 800

This paper examines estimates of the relationship between vocational training in high school and economic outcomes. We find that these relationships are relatively robust both with respect to variation in the way that type and quality of vocational training are measured and with respect to a number of other variations in specification. None of the evidence that we have developed supports the view that vocational training for male students in high school produces any special skills that are valued more highly by firms than those skills produced by a general high school education. The evidence does, however, suggest that in the early 1970s, commercial or business programs taken by young women did produce more highly valued skills. The evidence pertaining to later years is inconclusive.

The Effect of Risk on Interest Rates: A Synthesis of the Macroeconomic and Financial Views

Pentti J. Kouri
Working Paper No. 643
March 1981
JEL No. 431

This paper analyzes the effects of real income and uncertainty about the price level on equilibrium interest rates. I demonstrate that even if there are no outside nominal assets, the interest rate on nominal bonds contains a risk premium, or as the case may be, a risk discount. The sign and the magnitude of the deviation from the Fisher parity depend on the covariance between the purchasing power of money and real income.

The second part of the paper extends the model to two countries, two monies, and two bonds denominated in these two monies. In contrast with statements made in the literature, I show that the efficiency of international financial markets does not imply an equality of expected real interest rates on bonds denominated in different currencies, nor does it imply that the forward exchange rate should be an unbiased predictor of the future spot exchange rate. This is again true even when there are no outside nominal assets in the world economy.

Balance of Payments and the Foreign Exchange Market: A Dynamic Partial Equilibrium Model

Pentti J. Kouri
Working Paper No. 644
March 1981
JEL No. 431

This paper develops a dynamic partial equilibrium model of the foreign exchange market extending the standard textbook model in two respects: (1) capital account transactions are explicitly incorporated into the model; and (2) rational speculative behavior is introduced. At a point in time, or in a given day, fluctuations in exchange rates are dominated by new information that leads to revision of speculative expectations and by oth-

er disturbances of the capital account. In the long run fundamental factors, such as divergences of inflation rates and real changes that influence the balance of trade, become relevant in determining the trend of the exchange rate.

A variety of exercises and numerical simulations illustrate the usefulness of the dynamic supply-demand model in understanding the behavior of floating exchange rates in a world of high mobility of capital.

The Relative Stability of Money and Credit "Velocities" in the United States: Evidence and Some Speculations

Benjamin M. Friedman
Working Paper No. 645
March 1981
JEL No. 311

Is credit as closely related to income as is money? Results presented in the first half of this paper, based on a variety of methodological approaches, consistently indicate that the aggregate of outstanding credit liabilities of all nonfinancial borrowers in the United States bears as close a relationship to U.S. nonfinancial activity as do the more familiar asset aggregates such as the money stock (however measured) or the monetary base. In contrast to the asset aggregates, however, which exhibit little overall difference among themselves in this context, total nonfinancial indebtedness appears to be unique among credit aggregates in bearing this close relationship to income. Moreover, additional evidence of offsetting movements of the public and private components of total nonfinancial indebtedness further substantiates the case for stability in the aggregate.

The second half of the paper suggests three hypotheses that provide internally consistent potential explanations for this phenomenon: (1) an "ultrarationality" hypothesis that emphasizes acute perceptions and offsetting actions on the part of the private sector, (2) a "capital leveraging" hypothesis that emphasizes borrowing limitations and the need for tangible collateral, and (3) an "asset demand" hypothesis that emphasizes the private sector's role as a net lender. Initial efforts to match these hypotheses against data for the U.S. household and corporate business sectors yield only mixed results, however. The stability of the credit-to-income relationship remains for the present a major puzzle, therefore, although these three hypotheses do look sufficiently promising to warrant a much closer investigation.

Multiple Time-Series Models Applied to Panel Data

Thomas E. MaCurdy
Working Paper No. 646
March 1981

This study presents a general methodology for fitting multiple time-series models to panel data. The basic statistical framework considered here consists of a dynamic simultaneous equation model in which disturbances follow a permanent-transitory scheme; transitory components are generated by a multivariate, autoregressive, moving-average process. This error scheme admits a wide variety of autocovariance patterns and provides a flexible framework for describing the dynamic characteristics of longitudinal data with a minimal number of parameters. It is possible within this framework to consider generally specified, rational, distributed lag structures involving both exogenous and endogenous variables that include infinite order lag relationships. This paper outlines the generalizations of standard time-series models that are possible when using panel data. It identifies those instances in which procedures found in the time-series literature cannot be directly applied to analyzing longitudinal data. Data analysis techniques in the time-series literature are adapted for panel data analysis. These techniques aid in the choice of a time-series model and prevent one from choosing a specification that is broadly inconsistent with the data. Several procedures are proposed for estimating all of the parameters of a multiple time-series model, including both regression coefficients and parameters of the covariance matrix. The techniques developed here are robust in the sense that they do not rely on any specific distributional assumptions for their asymptotic properties, and in many cases their implementation requires only standard computer packages.

Exchange Rate Behavior under Full Monetary Equilibrium: An Empirical Analysis

John H. Makin
Working Paper No. 647
March 1981
JEL No. 430

The goal of this paper is to remedy difficulties with some extant empirical tests of the monetary approach to the determination of exchange rates. Four problems are addressed: (1) explication of, and allowance for, real exchange rate changes; (2) imposition of interest parity; (3) use of the forward rate as an unbiased predictor of the spot rate; and (4) modeling implications of official intervention in foreign exchange markets and of possible efforts to sterilize the effects of intervention in the monetary base.

Empirical tests conducted with monthly data on the dollar-DM exchange rate from March 1973 to December 1979 do not permit rejection of the complex joint hypothesis represented by equations estimated to test the monetary approach. Still, a large portion of the dollar-DM exchange rate in the 1973-79 monthly sample remains unexplained. This result suggests that exchange rates may be viewed as prices determined in asset markets where a large and unsystematic flow of information, not captured by monetary or other variables, produces large, unsystematic movements.

International Capital Flows under Full Monetary Equilibrium: An Empirical Analysis

John H. Makin
Working Paper No. 648
March 1981

This paper develops a theory of international capital flows based upon a monetary-equilibrium, rational-expectations theory of exchange rate determination, extended to include the official intervention and possible sterilization of its effects upon the monetary base that are part of the post-1973 system of limited flexibility of exchange rates. Once all arbitrage conditions are imposed along with rationality, capital flows are shown to depend only on the current expectation of a future, relative excess money supply.

Empirical testing reveals that international capital flows respond with persistent, damped oscillations to the growth of relative excess money. This phenomenon is a quantity adjustment corollary of "overshooting" of exchange rates in response to changes in relative excess money supply. Inclusion of a relative interest rate term, along with measures of growth of relative excess money supply, results in rejection of the hypothesis that such a variable provides any additional explanatory power regarding behavior of U.S. international capital flows.

Dividend Yields and Stock Returns: A Test for Tax Effects

Patrick Hess
Working Paper No. 649
March 1981

This paper examines the empirical relation between returns on stocks and dividend yields. Several equilibrium pricing models, incorporating differential taxation of dividends and capital gains, are nested as systems of time-series regressions. Estimates of these models and tests of parameter restrictions implied by the models are conducted within the context of Zellner's seemingly unrelated regression. The conclusion is that the data fail to support these models as well as does the hypothesis that dividends are neutral. The inability to distinguish between these competing hypotheses suggests the need for further research before definitive conclusions are reached regarding the tax impacts of dividends.

Some Theoretical Aspects of Base Control

Charles Freedman
Working Paper No. 650
March 1981
JEL No. 311

This paper focuses on the implications of using the monetary base or bank reserves as an instrument to control a monetary aggregate. After analyzing a series of theoretical models of increasing complexity, I conclude that in a system with either institutional or structural lags, base control may entail very sharp and possibly undamped oscillations of short-term interest rates. The shorter the time period over which the authorities choose to bring the monetary aggregate back to its target, the more volatile will be the movements of interest rates. Furthermore, there is an asymmetry in the U.S. institutional structure such that rigid implementation of the system of base control will, under certain circumstances, lead to a decline in short-term interest rates to very low levels. The final section of the paper is devoted to the examination of the Canadian institutional structure emphasizing the differences between it and the U.S. system.

Consumption Preferences, Asset Demands, and Distribution Effects in International Financial Markets

Paul Krugman
Working Paper No. 651
March 1981

This paper examines some of the microeconomic foundations of the portfolio approach to exchange rate determination. One widely accepted result, that investors will have a preferred local habitat in domestic currency-denominated assets is shown to be true only if investors are sufficiently risk averse. The paper also reports some preliminary calculations of the importance of exchange risk. Such risk is unlikely to play an important role in the determination of forward exchange rates, and the incentives for investors to diversify across currencies can be swamped by quite modest transaction costs.

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