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Program Report

The Government Budget and the Private Economy

The growth of the government budget, at the federal and at state and local levels, has been one of the most important changes in the American economy in the past three decades. Today the government budget directly controls more than one-third of national income, twice the share that it represented in 1950. Tens of billions of additional dollars are controlled by off-budget borrowing and credit guarantees. High tax rates and large spending programs alter private behavior in ways that make the impact of the government budget far greater than even the hundreds of billions of dollars of direct spending would suggest.

Problems such as low rates of capital formation, increasing rates of inflation, and weakened incentives for work effort and productivity have led to recent attempts to restrain the budget and restrict the government's role. The National Bureau of Economic Research therefore decided to undertake a major study of the impact of the government budget on the private economy.

As in all work at the NBER, the government budget study will emphasize objective empirical research. Researchers will develop a quantitative picture of the government's budget, the nature of its growth, and its impact on the private economy. The seven primary subjects for research within the overall project are described below.

1. The Impact of Taxation

Although there is an increasing awareness that existing marginal tax rates may be a substantial disincentive to work effort, saving, and risk taking, there are few useful quantitative estimates of these effects. As a result, there are still substantial disputes about the favorable incentive effects and revenue implications of reducing these high tax rates. Moreover, there is genuine uncertainty about personal saving and investment de-

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This issue of the *Reporter* highlights the Bureau's Project in The Government Budget and the Private Economy. Next, Jeremy Bulow discusses his work on private pensions. Then, Don Fullerton describes his research on the taxation of capital. After the quarterly Economic Outlook Survey are biographical sketches, news of NBER conferences, the Conference Calendar, and other NBER news and reports. The *Reporter* concludes with short summaries of recent NBER Working Papers.

isions resulting from changes in the tax treatment of savings and of investment income. Without better information, it is difficult to select the appropriate change in tax rules.

Other more general questions also deserve attention: How much of the decline in productivity growth since 1970 is the result of tax disincentives? How have increasing effective tax rates changed the profitability of investment in plant and equipment and the resulting volume and pattern of business investment? To what extent have high tax rates led to a growth of the underground economy, and what are the consequences of this for the functioning of the economy as a whole?

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In one of the studies in this area, Charles Clotfelter of Duke University is investigating the effect of the federal tax structure on charitable and philanthropic contributions of individuals, corporations, and foundations. Other researchers, including Jerry A. Hausman and James M. Poterba of MIT, Mervyn A. King of University of Birmingham (England), Harvey S. Rosen of Princeton University, and Lawrence H. Summers of Harvard University, are considering the impact of taxes on labor supply, saving, and risk taking.

2. The Growth of Government Spending

Any policies designed to control government spending must begin with an analysis of the ways in which government spending has grown. Why have some periods been characterized by much more rapid spending growth than others? Michael Boskin of Stanford University is currently working on a monograph on the measurement of government spending, including detailed analysis of such factors as off-budget items and of the appropriate treatment of government interest expenses.

Other questions to be considered are: What is the impact on spending of the increases in tax revenue that automatically occur because of our graduated structure of tax rates? How can changes in particular features of the so-called uncontrollable programs reduce their rates of growth? What determines the relative growth of different parts of the overall budget?

Finally, why has spending by some state governments increased very much more rapidly than spending by other state governments? And what can be learned from such voter referenda as California's Proposition 13, Massachusetts's Proposition 2½, and the much larger number of more specific referenda issues? Two studies are already underway to address these issues: Richard Sylla of North Carolina State University on "The Evolving Functions of Local, State, and Federal Government: Sources and Uses of Funds" and Hugh Rockoff of Rutgers University on "The Growth of Government Agencies."

3. Transfer Programs

The biggest growth of government spending has come in transfer payments, including Social Security, unemployment compensation, Medicare and Medicaid, food stamps, and disability. These programs have incentive effects on work effort, saving, health care spending, and other economic variables. Although economic conditions have changed radically since some of the programs were created in the 1930s, the basic structure of the programs remains unchanged. It is important to quantify the impact of the adverse incentives and to estimate the likely effects of alternative changes in these programs.

For example, what would be the effects on retirement, or personal savings and pension contributions, and on payroll tax receipts, of a gradual change in Social Security benefits? How would the effects differ if the change varied by age of retiree? What is the impact of unemployment compensation on the unemployment

rate and on the anti-inflationary effects of tight money? To stimulate thought in this area, NBER Taxation Program Director David F. Bradford of Princeton University organized a conference in Cambridge on November 5-6, 1982, on "Incentive Effects of Government Spending." (See *NBER Reporter*, Winter 1982/3, pages 11-12, for details of that conference.)

4. Public Sector Payrolls

The increase in government spending has been accompanied by a rapid rise in public employment at all levels of government. The wages of these employees frequently exceed the pay for comparable work in the private sector. Pension rights and other fringe benefits are almost invariably greater. Some analysts have suggested that public employees may be the primary beneficiaries of expanded government programs and that they therefore play a major role in the growth of government spending. In recent years, there has been a rapid growth of public sector unions at a time when private unions are in decline. All of these aspects of public employment and payrolls deserve investigation. To that end, the NBER labor program under Director Richard B. Freeman of Harvard University is continuing its research on public sector unions. David A. Wise, also of Harvard University, is leading a study on the compensation of public sector employees.

5. Major Spending Areas

Although economists are beginning to devote increasing attention to the effects of taxation, there is much less careful and objective analysis of major areas of government spending. In this part of the project, researchers will examine specific areas in which there has been substantial growth in government spending and in which government spending is likely to have a major impact on the private economy. The areas already selected for the analysis are health care, housing, and education. The careful examination of particular areas of spending should be valuable not only in itself but also as a means of pointing to general lessons about the growth and effects of the government budget.

6. State and Local Budgets

Although some of the topics already discussed involve state and local budgets, a separate part of the project will integrate these studies and fill in certain gaps. State and local governments, frequently encouraged by federal matching funds, have increased spending in a number of areas. State personal income and corporate taxes have grown rapidly. One group of researchers is beginning an extensive investigation of available data from states and localities on the size of their budgets, the sources of their finance, and the impact of federal policy on their patterns of spending and taxing.

The most important features of state and local governments are their diversity and their ability to respond to local differences in public preferences. The nature and consequences of their diversity will be examined,

along with the extent to which federal programs are limiting the ability of state and local governments to achieve that diversity and thus to reflect geographical differences across the country. Currently, Harvey Rosen is leading a group effort on state and local public finance, an area intimately related to these issues.

7. Government Debt and Deficits

One major piece of research on "Government Debt and Deficits" is currently being directed by NBER Financial Markets Program Director Benjamin M. Friedman of Harvard University and David Bradford. A number of topics will be considered in this area including: the extent to which government debt is treated as wealth by the private sector, the effect of government deficits on the international balance of payments, and the evaluation of the riskiness of government debt.

As with other NBER programs, the government budget project will include a number of conferences and program meetings. Relatedly, research results will be published in the NBER Working Papers series. Future issues of the *NBER Reporter* will detail these events and publications.

Research Summaries

An Analysis of Private Pensions

Jeremy I. Bulow

For many workers a private pension represents the third largest component of their wealth, behind Social Security and their houses. Yet few workers have a clear idea of what their pension claims are worth. Therefore, my research in the NBER's project on pensions is meant at least in part to increase our understanding of how to value pension benefits and other components of labor compensation.

Private pension plans are generally divided into two categories—defined contribution and defined benefit plans. In a defined contribution plan the firm typically contributes an amount of money related to the worker's salary to a trustee account managed on the worker's behalf. In principle, such plans are similar to the now-familiar IRA plans, except that the employer makes all or part of the contributions. These plans have traditionally been valued by researchers on a "termination" or

an "accrued benefits" basis. That is, if a firm contributes \$3000 on a worker's behalf to a plan in a given year, then pension fund researchers, to the extent that they have examined this issue, have concluded that the firm's true pension costs for the year in question were only \$3000.

Further, in defined contribution accounting, if a worker's salary is expected to rise (and consequently the firm's pension contribution for this worker is expected to rise proportionate to salary or by even more), then the future pension contribution is considered analogous to future salary payments. And, like salary, future contributions are "expensed" only when legally accrued by the worker.

Similarly, because the worker's benefit is tied legally to the investment performance of the pension assets, none of the investment gain or loss is considered to affect the firm's financial status. In fact, such gains or losses will typically not be mentioned in annual reports.

It is true that on occasion firms have supplemented the retirement pay of older workers even under defined contribution plans—for example, the pay of elderly professors who found the real value of their pensions to be less than expected—but such extra pay has traditionally been expensed when the firm actually obligated itself to those payments. Again, this is similar to the treatment of salary—where if older workers in a firm are paid more than they are worth, then firms expense those salary costs when actually incurred, instead of projecting a future liability for the firm based on the age/tenure distribution of its current work force.

Defined benefit pension accounting, on the other hand, is a world unto itself. Not only economists, but also members of the accounting profession, are divided in their views of defined benefit plans. There are two generic forms of defined benefit pension accounting—accrued benefit and projected benefit methods. Conceptually, accrued benefit methods are meant to resemble the way in which we account for defined contribution plans, salary, and other benefits—by looking at the worker on a "termination basis." That is, under a strict application of "accrued benefit" principles, the present value of a worker's pension claim on any given day is the amount of benefit he would receive if his employment were terminated immediately. Any change in that present value from year to year is the result of either: (1) pension compensation included in the present year's total compensation; (2) interest earned on beginning-of-year pension wealth; or (3) change in actuarial factors—for example, the increased probability that the worker will indeed survive to receive a pension given that he is now one year closer to the commencement of benefits.

By contrast, it is quite difficult to find coherent economic logic in the typical "projected benefit" computation. Under projected benefit methods, firms typically estimate the entire present value of a worker's final pension and then use some arbitrary scheme to allocate pension costs across the worker's career. The analogy in a nonpension world would be if firms used some scheme for estimating the present value of a worker's lifetime wage payments and then announced an

arbitrary costing method for expensing its wage payments, not dependent on the amount actually paid in a given year.

For example, a projected benefit method may involve the firm writing off a constant percentage of a worker's salary as a pension cost, without any regard to the amount legally accrued. Although most benefits are legally accrued by older workers, the projected benefits method assumes that these benefits are earned evenly throughout one's career. Consequently, the projected benefits method tends to vastly overstate a firm's legal pension liability.

My research has pointed to accrued benefit accounting as the most informative for pension beneficiaries, firms, and analysts. There are two principal reasons. First, consider a world of "spot" labor markets, where in each period a worker negotiates a new one-period compensation agreement with his employer. In a fully competitive labor market with no firm-specific human capital, it is a matter of indifference to the worker (and the firm) whether he stays with his current employer or not—his wealth is the same in either case. Clearly, then, the worker's pension wealth is the same regardless of whether he remains with the firm or leaves, and the termination basis gives the correct valuation of benefits. Even if the analysis is generalized to include firm-specific human capital but one-period labor contracts, the same analysis is applicable. The outcome of negotiations is affected by "threat points." For example, the worker may be able to negotiate a higher salary if the firm must pay him severance if he leaves. In the salary area, the worker's "threat point" is to leave with whatever he has been paid already. In the pension area, the worker can leave with his termination, or accrued, benefits.

Second, consider the case of long-term labor contracts where (for whatever reason) workers are not paid on a spot-market basis. Perhaps older workers are paid more than younger workers for the same output. Advocates of projected benefit methods have argued that if such implicit labor contracts exist, then projected benefit accounting, with its bias to overstating young workers' pension costs, may be a way of tying pension costs more closely to "economic" labor costs. (It is interesting to note that none of these advocates has considered making the illogically consistent argument that firms should write off more than their actual health benefits for young workers—who need less health care than older workers—as a way of evening out health compensation.) The main problem with this argument is that it implicitly distinguishes firms with defined benefit plans on a basis for which there is limited empirical justification at best. There is no logical reason that a firm with a defined contribution pension plan could not tilt its total compensation package in favor of older workers just as much as a firm with a defined benefit plan. Whether firms with defined benefit plans have bigger "implicit contracts" than those with defined contribution plans is an unresolved, empirical issue. Until this issue is resolved, it is hard to justify asking defined benefit firms to put an implicit liability on their balance sheet and not

ask the same of firms with defined contribution plans.

Current accrued benefit methods used by actuaries are not identical to the pure "termination" accrued benefit method described above. Perhaps the major disparity is in the area of early retirement benefits. Many pension plans give workers over a certain age a better than actuarially fair deal if they retire early. The strict accrual method would assume de facto that such workers threaten to retire at each moment and are encouraged to stay at the firm (and not exercise their early retirement option) only by salaries that are greater than they would receive without the early retirement threat. In fact, typical accrued benefit accounting methods assume that only a fraction of workers eligible for early retirement will accept and that the remainder who continue working will not have to receive higher salaries than if they did not have this option.

The early retirement area also provides the greatest challenge to date to those of us who have been strong advocates of the accrued benefit method. One problem is that the worker who suddenly becomes eligible for early retirement may find the present value of his accrued benefit pension wealth increased by as much as a year's pay overnight. This particular compensation "spike" is generally not found in firms with defined contribution plans or with no pension. It is of only small solace that this "problem" is not unique to the pension area. For example, college professors often receive "spikes" in their compensation during years when they have children receiving tuition benefits.

One speculation about the way firms may ameliorate the effect of the early retirement spike (a similar spike occurs on the day an employee becomes vested in his pension, but that spike is trivial by comparison) is by offering larger severance pay to those workers whose employment is terminated prior to the early retirement date. However, if in fact firms with lucrative early retirement plans systematically offset this benefit with severance pay policy, then in the absence of any valuation of contingent severance liability an analyst comparing a firm with early retirement with other firms may wish to modify the strict accrued liability in making relative valuation calculations.

Another, but lesser, problem with the strict accrued benefit approach is that it oversimplifies the benefit valuation problem. For example, the strict accrued benefit approach assumes that if a firm has an overfunded pension plan, any changes in the value of the pension portfolio inure to the stockholders. Court cases involving Grumman and A&P have indicated that this principle is not literally true—workers may benefit from excess funding. An analogy can be made to general contingent claims analysis. Because judges often do not have senior creditors paid off in full before junior creditors get anything, the usual contingent claims valuation of corporate debt and equity is only an approximation to the real value, considering judges' behavior. Similarly, the accrued benefit method can provide at best an approximation to the real value of workers' pension claims.

Clearly, the question of how to value a worker's pen-

sion has not been fully resolved yet—although we understand the issues much better than we did five or six years ago. This progress on valuing pension liabilities has also permitted progress on issues concerning the asset side of the pension balance sheet—questions of funding and investment policy—and has enabled us to obtain a greater understanding of the role of pensions as part of total compensation. Furthermore, efforts by economists to understand pension compensation are providing important insights into the broader problems of valuing total compensation packages, and into the nature of labor contracting in general.

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Examining Taxes on Capital

Don Fullerton

My research on the taxation of income from capital has proceeded along two lines. First, as described in this brief report, I have developed a computational, general equilibrium model of the U.S. economy and tax system. This model has been used to evaluate the incidence and economic efficiency of particular tax reforms and to analyze the U.S. tax system in general. Second, and also discussed here, I have worked on the measurement and use of effective rates of tax on capital income in the United States and other countries. In the final part of this report, I will comment on my efforts to combine these two lines of inquiry, that is to use marginal effective tax rates in the computational equilibrium model.

Tax reform in the United States can easily involve major shifts of resources. Producers react to new incentives by changing their plans for output, investment, and the use of labor, just as individuals react by changing their plans for purchases, savings, and the supply of labor. As actions and reactions reverberate throughout the economy, in the absence of some other major shock, these resources tend toward a new equilibrium allocation among industries, with a new set of relative prices among all commodities. Arnold Harberger was the first to exploit this equilibrium notion in studying taxes, but he was limited by his analytical framework to only two factors of production, two composite outputs, one aggregate consumer, and only one

small tax change from an initial equilibrium with no other distortions.¹

Other researchers have been able to expand this model in certain respects, but more significant improvements were made possible by Herbert Scarf, who developed an algorithm to compute equilibrium prices simultaneously in many markets.² John Shoven and John Whalley showed how to incorporate taxes into this new methodology, after which I began work with them on building a larger, more current model of the U.S. economy and tax system.³

This model now includes 18 producers and 12 consumer groups, government spending and transfers, savings, investment, and international trade. The consumers each have endowments of capital and labor that they sell in the market (or retain for leisure). Their income can then be spent on any of the produced commodities, or it can be saved. In equilibrium, total savings are used to purchase investment goods that are also produced by the 18 industries; this new investment is added to the capital stock for the next equilibrium calculation in a sequence. Labor endowments grow exogenously, and the model is parameterized in such a way that the status quo represents a steady state growth path.

In this "benchmark" equilibrium, corporate income taxes, property taxes, and part of the personal income tax are modeled as ad valorem taxes on industry use of capital. Payroll and other personal taxes are applied to labor, excise taxes are applied to particular commodities, and all U.S. taxes are similarly modeled. By changing rates appropriately, one can devise the "model-equivalent form" of some tax reform proposal and calculate a new equilibrium sequence that approaches a new steady state path. Gains and losses in the present value of real income can be measured for each consumer group and for the economy as a whole.

The model became particularly detailed in the taxation of income from capital in order to evaluate properly proposals to integrate corporate and personal income taxes.⁴ This detail also allowed the evaluation of

a number of different kinds of proposals to change taxes on interest, dividends, rents, capital gains, pensions, and the treatment of inflation indexing. Generally, in this model, Charles Becker and I find that there are intersectoral welfare gains from any reform that tends to equalize the varying rates of tax among industries.⁵ There are also intertemporal welfare gains from any plan that lowers the overall taxation of income from capital. A comprehensive tax on consumption would go furthest in these directions, because all taxes on capital could be equalized at a rate of zero. By including all income and deducting all savings, the individual tax base could be applied to a graduated schedule. Variations on this kind of tax system provide the largest welfare gains in the model.⁶

In addition to particular reforms, more conceptual problems can be considered when using the model. In one paper, for example, I use the model to plot the total revenue resulting in equilibrium from each different labor tax rate.⁷ The location and peak of the resulting Laffer curve is shown to depend on the assumed labor supply elasticity. Charles Ballard, Shoven, and Whalley use the model to evaluate the complete removal of each tax instrument as well as the increment to excess burden that is created by raising just one more dollar of revenue from each source.⁸ While total excess burden is about 20 percent of total revenues, marginal excess burden might be as high as 50 percent of the marginal dollar of revenue.

Finally, in this kind of model, it is interesting to consider the sensitivity of results to alternative specifications. It is quite simple to vary elasticity parameters. In one paper, for example, Shoven, Whalley, and I find that intersectoral gains are directly proportional to the assumed elasticity of substitution between labor and capital in production.⁹ In another paper, with Andrew Lyon, I find that the assumed savings elasticity affects not only the size of the welfare gain from a given proposed reform but also the ordering of different reforms.¹⁰

¹A. C. Harberger, "The Incidence of the Corporation Income Tax," *Journal of Political Economy* LXX-3, June 1962, pp. 215-240, and "Efficiency Effects of Taxes on Income from Capital," in M. Krzyzaniak, ed., *Effects of Corporation Income Tax*, Detroit: Wayne State University Press, 1966.

²H. Scarf, with the collaboration of T. Hansen, *The Computation of Economic Equilibria*, New Haven: Yale University Press, 1973.

³J. B. Shoven, "The Incidence and Efficiency Effects of Taxes on Income from Capital," *Journal of Political Economy* LXXIV-6, December 1976, pp. 1261-1284; J. B. Shoven and J. Whalley, "A General Equilibrium Calculation of the Effects of Differential Taxation of Income from Capital in the United States," *Journal of Public Economics* I, November 1972, pp. 281-321, and "General Equilibrium with Taxes: A Computational Procedure and an Existence Proof," *Review of Economic Studies* XL-4, October 1973, pp. 475-489.

⁴D. Fullerton, A. T. King, J. B. Shoven, and J. Whalley, "Corporate and Personal Tax Integration in the United States: Some Preliminary Findings," in R. H. Haveman and K. Hollenbeck, eds., *Microeconomic Simulation Models for Public Policy Analysis*, vol. 2, New York: Academic Press, 1980, and "Corporate Tax Integration in the United States: A General Equilibrium Approach," *American Economic Review* LXXI-4, September 1981, pp. 677-691, and NBER Reprint No. 205, September 1981.

⁵C. Becker and D. Fullerton, "Income Tax Incentives to Promote Saving," *National Tax Journal* XXXIII-3, September 1980, pp. 331-351, and NBER Reprint No. 143, September 1980.

⁶D. Fullerton, J. B. Shoven, and J. Whalley, "Replacing the U.S. Income Tax with a Progressive Consumption Tax: A Sequenced General Equilibrium Approach," *Journal of Public Economics* XX-1, February 1983, pp. 3-23, and NBER Working Paper No. 892, May 1982.

⁷D. Fullerton, "On the Possibility of an Inverse Relationship between Tax Rates and Government Revenue," *Journal of Public Economics* XIX-1, October 1982, pp. 3-21, and NBER Reprint No. 344, October 1982.

⁸C. L. Ballard, J. B. Shoven, and J. Whalley, "The Welfare Cost of Distortions in the U.S. Tax System: A General Equilibrium Approach," NBER Working Paper No. 1043, December 1982.

⁹D. Fullerton, J. B. Shoven, and J. Whalley, "General Equilibrium Analysis of U.S. Taxation Policy," 1978 Compendium of Tax Research, Washington, D.C.: Office of Tax Analysis, U.S. Department of the Treasury.

¹⁰D. Fullerton and A. B. Lyon, "Uncertain Parameter Values and the Choice among Policy Options," NBER Working Paper No. 1111, April 1983.

Any of three different proposals might have the highest welfare gain, depending on the assumed value of this elasticity.

Other sensitivity tests are more complex. For example, substantial modeling changes were required when I tried to ascertain how results depend on the assumption that capital is fully and freely mobile among industries.¹¹ When disinvestment is limited to physical depreciation in each industry, capital cannot move as rapidly to the more efficient location. Welfare gains fall by a small but noticeable amount. In another model, Roger Gordon and I vary other assumptions about the distorting nature of Social Security taxes, property taxes, and corporate income taxes.¹² Moreover, we can gather further information about assumptions in this model by looking at the results of other models. Different assumptions and procedures are used by Joel Slemrod and by Alan Auerbach and Laurence Kotlikoff when they devise their own models to address some of the same issues.¹³ Several of these models, including the Fullerton-Shoven-Whalley model and the Fullerton-Gordon model, are compared in detail in a paper I wrote with Yolanda Henderson and John Shoven.¹⁴

My other major line of research revolves primarily around the international tax comparisons project funded by NBER. This project involved numerous researchers in four countries, and it resulted in a book, edited by Mervyn King and myself, to be published by the University of Chicago Press.¹⁵ In it, we measure marginal effective rates of tax on income from capital in each country, including corporate, personal, and property taxes, and combining taxes at all levels of government. By distinguishing among several assets, industries, sources of finance, and ownership categories, we are able to calculate a distribution of different rates that can exist in any one country at one time. Probably the most important information to come out of this study is the great dispersion of rates in each of the four countries. Double taxation indeed applies to new shares sold to house-

holds, especially if the funds are used to buy buildings or inventories with no special allowances. Total tax rates exceed 100 percent. At the other extreme, however, machinery receives special credits and deductions and can be financed by selling debt to tax-exempt institutions. Because of these allowances and interest deductions, with no subsequent taxation of interest receipts, total *subsidy* rates exceed 100 percent. This dispersion is greatest in the United Kingdom, somewhat less in Sweden, and least in the United States and Germany.

Another surprising result is that credits, allowances, and interest deductions at the corporate level can more than outweigh the tax for marginal investments. In the United Kingdom, Sweden, and the United States under the 1982 tax law, elimination of the entire corporate tax system results in a *higher* marginal effective total rate of tax on income from capital. As a general matter, King and I find that effective tax rates are lower than previously thought, and that they increase less with inflation than previously thought. At some point, with further inflation, they actually begin to fall, at least for the United States and Germany.

Although this book includes considerable sensitivity analysis, it raises a number of other interesting research questions. Some of these are addressed in my paper with David Bradford, where we show how the marginal effective tax rate can depend on certain assumptions about interest rates, inflation rates, and arbitrage among alternative real and paper assets.¹⁶ Many such measurement problems are surveyed in another paper, where I also try to distinguish carefully between an average effective tax rate and a marginal effective tax rate.¹⁷ The average rate is measured by the ratio of actual taxes paid to actual capital income, on investments already in place. The marginal rate is measured by looking at the future life of a hypothetical investment, using one formula for the cost of capital or pretax return and another formula for the real posttax return. When various average rate measures are calculated for each of 18 industries and compared to various marginal rate measures for the same 18 industries, there generally is no resemblance. The correlation coefficient is often less than zero but never greater than 0.3. This result might be considered surprising, but a little more thought generates 11 separable but plausible reasons that the effective tax rate on new investment could differ from the rate for observed taxes on past investment in any one industry.

These differences between effective and observed rates also present genuine problems for the general equilibrium models discussed above. In the Fullerton-Shoven-Whalley model, we employ average effective tax rates for each of the 18 industries. The allocation of

¹¹D. Fullerton, "Transition Losses of Partially Mobile Industry-Specific Capital," *Quarterly Journal of Economics*, February 1983, pp. 107-125, and NBER Reprint No. 362, May 1983.

¹²D. Fullerton and R. H. Gordon, "A Reexamination of Tax Distortions in General Equilibrium Models," in M. Feldstein, ed., *Behavioral Simulation Methods in Tax Policy Analysis*, Chicago: University of Chicago Press, 1983.

¹³J. Slemrod, "A General Equilibrium Model of Taxation with Endogenous Financial Behavior," in M. Feldstein, ed., *Behavioral Simulation Methods*. . . ; and A. J. Auerbach and L. J. Kotlikoff, "National Savings, Economic Welfare, and the Structure of Taxation," in M. Feldstein, ed., *Behavioral Simulation Methods*. . .

¹⁴D. Fullerton, Y. K. Henderson, and J. B. Shoven, "A Comparison of Methodologies in Empirical General Equilibrium Models of Taxation," in J. B. Shoven and H. Scarf, eds., *Applied General Equilibrium Analysis*, Cambridge, England: Cambridge University Press, forthcoming.

¹⁵M. A. King and D. Fullerton, eds., *The Taxation of Interest from Capital: A Comparative Study of the United States, United Kingdom, Sweden, and West Germany*, Chicago: University of Chicago Press, forthcoming.

¹⁶D. F. Bradford and D. Fullerton, "Pitfalls in the Construction and Use of Effective Tax Rates," in C. R. Hulten, ed., *Depreciation, Inflation, and the Taxation of Income from Capital*, Washington, D.C.: Urban Institute Press, 1981.

¹⁷D. Fullerton, "Which Effective Tax Rate?" NBER Working Paper No. 1123, May 1983.

capital, however, depends on each industry's incentives to undertake investments at the margin.

In the Fullerton-Gordon model, we use an explicit formula for the cost of capital at the margin. Because a loss on any marginal investment would typically reduce taxable income from intramarginal investments, we assume full loss offset. The taxing government shares a fixed percentage of any profit or loss, so that much of the tax revenue is mere payment for the value of risk accepted by government. The only investment disincentive is the tax on the small, risk-free return. Implied marginal effective tax rates are low, and integration of corporate and personal taxes lowers them further. Welfare results are reversed from the previous model, since net losses result when corporate tax revenue is replaced by taxes that distort labor supply choices.

These results are fairly controversial, but they depend on the treatment of risk rather than on the use of marginal effective tax rates per se. It is more common to use a model with perfect certainty, in which marginal effective tax rates are not so low. Also, because marginal effective tax rates are measured for individual assets, they are more appropriate than average rates for modeling changes in depreciation schedules and investment tax credits, such as those enacted in 1981 and 1982. Thus, in order to use marginal effective tax rates in the general equilibrium model, we need data on the composition of assets in each of the 18 industries. In my paper with Yolanda Henderson, we measure these marginal rates for each asset, convert them to rates for each industry, and simulate long-run effects of these new laws.¹⁸ We find that the intertemporal welfare gains from reduced capital taxes outweigh the losses associated with any replacement taxes, but the intersectoral gains are not as great as those from some other proposals that would have treated various assets and industries more equally.

Economic Outlook Survey

Second Quarter 1983

Victor Zarnowitz

According to the May survey taken by NBER and the American Statistical Association, professional economic forecasters now expect substantially higher rates of growth in total real GNP than they did three months ago. Presently gains at annual rates of 4.5 percent to 5 percent per quarter are projected for the year ahead; then the range was 2.8 percent to 4.5 percent. At the same time, inflation forecasts also have become more optimistic: the consumer price index (CPI) is to increase 3.2 percent and 4.9 percent on the average in 1983 and 1984, respectively. (In March, the corresponding predictions were 4.1 percent and 5.2 percent.)

Recovery to Continue in 1984

The year-to-year growth in the economy's total output is estimated at 2.6 percent in 1982-83 and 4.7 percent in 1983-84, according to the median point forecasts for the NBER/ASA group. The gain between 1983:2 and 1984:2 will also be 4.7 percent. These figures are significantly higher than their counterparts in the previous (March) survey.

The means of the probabilities attached by each participant to the alternative outcomes for annual changes in real GNP are distributed as follows (in percent):

Percent range	1982-83	1983-84
4.0 or more	16	61
2.0 to 3.9	67	31
Less than 2.0	17	8

They show a definite shift toward higher growth rates. The weighted averages of these probabilistic forecasts are about 3 percent for 1982-83 and 4.2 percent for 1983-84.

The chances of a decline in real GNP during any quarter in the year ahead are assessed as less than 20 in 100 by all but a very few respondents and as less than 40 by all. On the average, these probabilities are quite low, varying from 6 and 9 for the last two quarters of 1983 to 12 in the first half of 1984.

Expected Inflation Moderate but Slowly Rising

The GNP implicit price deflator (IPD) will rise 4.7 percent in 1982-83 and 5.1 percent in 1983-84, in terms of the median predictions from the survey. At annual rates, percentage rises of 4.1, 4.5, 4.9, and 5.3 are expected in the current and the next four quarters, from 1983:2 through 1984:2.

¹⁸D. Fullerton and Y. K. Henderson, "Long-Run Effects of the Accelerated Cost Recovery System," NBER Working Paper No. 828, December 1981.

Projections of GNP and Other Economic Indicators, 1983-84

	Annual				
	1982 Actual	1983 Forecast	1984 Forecast	Percent Change	
				1982 to 1983	1983 to 1984
1. Gross National Product (\$ billions)	3059.3	3286.0	3607.0	7.4	9.8
2. GNP Implicit Price Deflator (1972 = 100)	207.2	216.9	228.0	4.7	5.1
3. GNP in Constant Dollars (billions of 1972 dollars)	1476.9	1515.0	1586.0	2.6	4.7
4. Unemployment Rate (percent)	9.7	10.0	9.1	0.3 ¹	-0.9 ¹
5. Corporate Profits After Taxes (\$ billions)	117.1	134.0	163.5	14.4	22.0
6. Nonresidential Fixed Investment (billions of 1972 dollars)	165.7	162.0	169.0	-2.2	4.3
7. New Private Housing Units Started (annual rate, millions)	1.1	1.6	1.7	47.0	7.8
8. Change in Business Inventories (billions of 1972 dollars)	-9.2	-2.0	10.0	7.2 ²	12.0 ²
9. Treasury Bill Rate (3-month, percent)	10.7	8.0	7.9	-2.7 ¹	-0.1 ¹
10. Consumer Price Index (annual rate)	6.1	3.2	4.9	-2.9 ¹	1.7 ¹

	Quarterly						Percent Change	
	1983 Q1 Actual	Q2	1983 Q3	Q4	1984		Q1 83 to Q1 84	Q2 83 to Q2 84
					Q1	Q2		
1. Gross National Product (\$ billions)	3176.7	3242.0	3321.0	3397.0	3480.0	3561.5	9.5	9.9
2. GNP Implicit Price Deflator (1972 = 100)	213.4	215.6	217.9	220.4	223.1	225.9	4.5	4.8
3. GNP in Constant Dollars (billions of 1972 dollars)	1488.5	1505.8	1523.2	1541.5	1559.0	1576.9	4.7	4.7
4. Unemployment Rate (percent)	10.4	10.2	9.9	9.7	9.5	9.3	-0.9 ¹	-0.9 ¹
5. Corporate Profits After Taxes (\$ billions)	112.5	129.0	139.0	145.0	152.0	159.5	35.1	23.6
6. Nonresidential Fixed Investment (billions of 1972 dollars)	162.0	161.3	162.0	163.0	165.0	168.0	1.9	4.2
7. New Private Housing Units Started (annual rate, millions)	1.7	1.6	1.6	1.6	1.7	1.7	-1.2	7.9
8. Change in Business Inventories (billions of 1972 dollars)	-12.4	-2.1	2.9	6.4	7.8	9.0	20.2 ²	11.1 ²
9. Treasury Bill Rate (3-month, percent)	8.1	8.1	7.9	8.0	8.0	8.0	-0.1 ¹	-0.1 ¹
10. Consumer Price Index (annual rate)	-0.3	3.8	4.5	4.6	4.9	4.9	5.2 ¹	1.1 ¹

SOURCE: National Bureau of Economic Research and American Statistical Association, Business Outlook Survey, June 1983. The figures on each line are medians of forty individual forecasts.

¹Change in rate, in percentage points.

²Change in billions of dollars.

For the annual changes in IPD, most of the means of the reported probability distributions fall between 4 percent and 6 percent in both 1983 and 1984, as shown below:

Percent range	1982-83	1983-84
6.0 or more	15	27
4.0 to 5.9	68	59
Less than 4.0	17	14

However, a shift toward a higher expected inflation rate in the latter year is evident. The weighted means of these distributions are 4.8 percent and 5.2 percent, close to but slightly higher than the averages of the corresponding point predictions.

The anticipated quarterly rises in the CPI, expressed at annual rates, increase gradually, according to the median forecasts. The percentage figures for the five consecutive quarters 1983:2-1984:2 are 3.8, 4.5, 4.6, 4.9, and 4.9.

Stable and Similar Interest Forecasts

The forecasters seem to agree that they cannot foresee a pattern in the variation of the interest rates. The median predictions of the 3-month Treasury bill rate decline only from 8.1 percent to 7.9 percent between 1983:2 and 1983:3 and then remain steady at 8 percent through mid-1984. The annual averages for 1983 and 1984 are 8 percent and 7.9 percent. These group forecasts express a rather close consensus among the individuals. The central half of the longest forecasts (for 1984:2 and 1984 as a whole) lies between 7.5 percent and 8.4 percent, while the low and high outliers are 6.9 percent and 10 percent. For the nearer targets, the dispersion of the individual predictions is smaller: for example, the standard deviation for 1983 is 0.36 of a percentage point; for 1984 it is 0.74.

The yields on new high-grade corporate bonds will decline from 11.5 percent in 1983:2 to 11.3 percent in

the next two quarters and 11 percent in the first half of 1984. The average for 1984 is also 11 percent (as compared with 11.5 percent for 1983). Here, too, the variation among the individual point forecasts is relatively small, with the bulk of them falling within ± 1 percentage point from the group averages.

An Upswing in Profits

Corporate profits after taxes, in billions of current dollars, are expected to rise from 112 in 1983:1 to 152 in 1984:1, a gain of 35 percent. Median forecasts have this total rising to 160 in 1984:2 and they indicate that it will exceed 170 late next year. (The annual figures for 1983 and 1984 are 134 and 164.) If so, profits by this measure would approximately regain their last peak levels of 1979. This would also imply a rise in the share and margin of profits, which are now still very low. (It should be noted that GNP in current dollars is projected to increase somewhat less than 10 percent in both 1983-84 and the year ahead.)

Rising Production and Gradual Reductions in Unemployment

The index of industrial production, which covers manufacturing, mining, and public utilities, will gain 3.2 percent in 1982-83 and 8.4 percent in 1983-84. (In March, the corresponding median forecasts were 1.7 percent and 7.8 percent.) Its rise between 1983:1 and 1984:1 is to average about 11 percent. In 1984 the index may increase more slowly but it will continue gaining and finally move above its previous peak levels of 1979 and 1981.

The unemployment rate will decline steadily but slowly (presumably in part because of the growth in the labor force), by about 2/10 to 3/10 of one percentage point per quarter, according to the average forecast. It should fall to 9 percent or slightly less in the coming year: the interquartile ranges composing the central half of the individual predictions are 9.1 percent-9.5 percent for 1984:2 and 8.9 percent-9.3 percent for 1984 as the whole. Even the most optimistic forecasters do not anticipate the jobless rates to average less than 8.5 percent in 1984.

Consumption and Investment: The Shifting Focus of the Recovery

Consumption expenditures in constant dollars are to gain 3 percent in 1982-83, and 3.8 percent in 1983-84. The first figure is larger, the second smaller, than the corresponding expected increases in real GNP (2.6 percent and 4.7 percent). In the year ahead, the recovery will come to be supported relatively less by consumption and more by business investment. Nonresidential fixed investment in 1972 dollars is projected to fall 2.2 percent in 1982-83 but to rise 4.3 percent in 1983-84. It will turn up very slowly at first but will pick up some steam in each successive quarter: the median predictions for 1983:3-1984:2 call for increases at annual rates of 1.6 percent, 2.4 percent, 4.9 percent, and 7.4 percent. Some further gains late in 1984 are indicated, but at \$169 billion the forecast for 1984 as a whole is still a little below the last peak year (\$172 billion in 1981).

Real residential fixed investment will rise 33 percent in 1982-83 and 11 percent in 1983-84, according to the group average forecasts. This would bring it up to about the level of \$60 billion (1972 dollars) in 1984, close to 1978, the last peak year. Housing starts, however, are to average only 1.74 million units in 1984, well below the 2.04 million units of 1978 (but some forecasters are considerably more optimistic here).

The forecasts of change in business inventories, a highly volatile variable, differ greatly across individuals, as usual, but generally anticipate a relatively moderate buildup. The median figure for 1984:2, for example, is \$9 billion annual rate in 1972 dollars; the lower and upper quartiles are \$7.8 billion and \$11.8 billion.

Most forecasters expect neither an improvement nor much further deterioration in the net exports situation (although the distributions seem skewed in the direction of pessimism). The median figures for 1983 and 1984 are \$21 billion and \$20 billion annual rate in 1972 dollars, both close to the latest recorded values.

Government Purchases and Policy Assumptions

Federal government purchases of goods and services will rise in real terms 2.8 percent in 1982-83, 5 percent in 1983-84, and 6.6 percent between 1983:2 and 1984:2. The corresponding forecasts for state and local government purchases are quite low: 0.4 percent, 1.3 percent, and 1.7 percent.

Forecasters generally assume that the recently enacted tax laws will become effective on schedule; a few expect additional taxes in 1983. A buildup of defense outlays in the 4-6 percent range was assumed by 20, a buildup of 7-10 percent by 17 respondents. (In March, a large majority chose the latter option.) M1 growth rates of 7-9 percent and M2 growth rates of 7-11 percent are frequently quoted. There are divided views on whether or not the demand for energy will increase and on whether or not the dollar will weaken.

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

Jeremy I. Bulow

Jeremy I. Bulow has been a faculty research fellow in NBER's Programs in Economic Fluctuations and Pensions since 1979. Bulow received his B.A. and M.A. in economics from Yale University in 1975 and his Ph.D. from MIT in 1979. Since 1979 he has been an assistant professor in Stanford's Graduate School of Business and has also taught in the university's economics department.

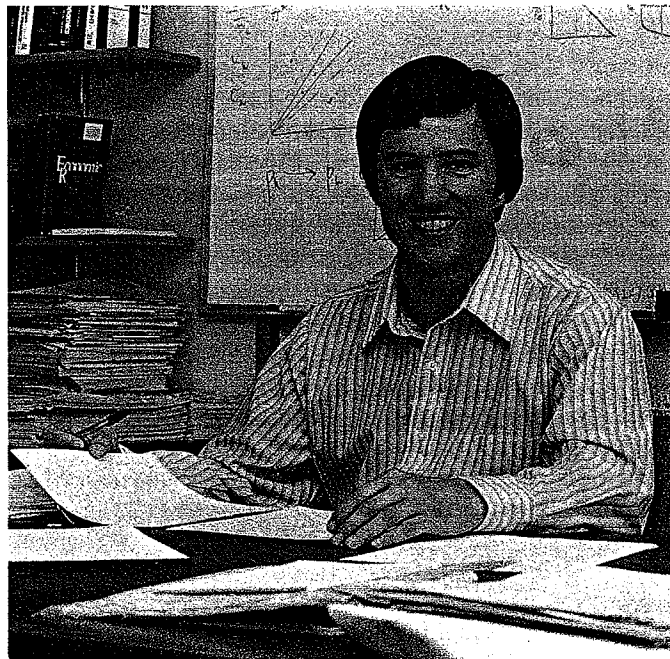
Bulow, who was a National Fellow of the Hoover Institution this year, has served in past years as a consultant to the Banco de Portugal and to Cravath, Swaine and Moore. In addition, professional journals have published many of Bulow's papers; his research interests include inflation accounting, corporate finance theory, industrial organization, pension funds, and public finance.



An avid baseball fan, Bulow has a tendency to calculate player and team statistics without benefit of pencil and paper. He also organized the first annual Irving Fisher All-Star Tennis Tournament while at MIT and invented the "Presidential Stock Market Game" at Stanford's Business School.

Don Fullerton

Research Associate Don Fullerton of Princeton University has been a member of NBER's Program in Taxation since 1979. Fullerton received a B.A. in economics from Cornell University and a Master's and Ph.D. from the University of California at Berkeley. During the last two years of his graduate program, Fullerton worked at Stanford University with NBER Research Associate John Shoven on tax research for the U.S. Department of the Treasury.



In 1978, Fullerton was named assistant professor of economics and public affairs at the Woodrow Wilson School and department of economics, Princeton University. In fall 1983 he will begin a one-year National Fellowship at Hoover Institution, Stanford University.

Fullerton's research interests include the computation of economic equilibriums, the estimation of effective tax rates on marginal investments, and the evaluation of tax reform proposals. He has written a number of journal articles on various aspects of taxation and is the editor or coauthor of two forthcoming books: *The Taxation of Income from Capital: A Comparative Study of the United States, United Kingdom, Sweden, and West Germany* (edited with Mervyn A. King) and *Evaluation of U.S. Taxation Policy Using a Numerical General Equilibrium Approach* (with Charles L. Ballard, John B. Shoven, and John Whalley).

Fullerton lives with Jane Montague in Princeton Junction, New Jersey. When he's not working on their house, he lifts weights, and runs. In the 10-mile Cherry Blossom Run in Washington, D.C., last March, Fullerton placed 934th, "right behind Bill Rodgers."

Pensions, Labor, and Individual Choice

Members of NBER's Project on Pensions and distinguished guests met at a conference on March 23-26 to discuss "Pensions, Labor, and Individual Choice." The three-day agenda was:

David T. Ellwood, Harvard University and NBER, "Pensions and the Labor Market: A Starting Point"

Laurence J. Kotlikoff, Yale University and NBER, and David A. Wise, Harvard University and NBER, "Labor Compensation and the Structure of Private Pension Plans: Evidence for Contractual versus Spot Labor Markets"

Discussant: Zvi Bodie, Boston University and NBER

Richard B. Freeman, Harvard University and NBER, "Pensions and Pension Funds under Trade Unionism"

Discussant: Albert Rees, Alfred P. Sloan Foundation

Paul J. Taubman, University of Pennsylvania and NBER, "Determinants of Pension Benefits"

Discussant: Victor R. Fuchs, Stanford University and NBER

Jerry A. Hausman, MIT and NBER, and David A. Wise, "Social Security, Health, and Retirement"

Discussant: Gary T. Burtless, Brookings Institution

Michael D. Hurd, SUNY, Stony Brook and NBER, and John B. Shoven, Stanford University and NBER, "The Distributional Impact of Social Security"

Discussant: Henry J. Aaron, Brookings Institution

W. Kip Viscusi, Duke University and NBER, "The Structure of Uncertainty and the Use of Nontransferable Pensions as a Mobility-Reduction Device"

Discussant: Sherwin Rosen, University of Chicago and NBER

Edward P. Lazear, University of Chicago and NBER, "Pension Benefit Formulas and Worker Productivity"

Discussant: Roger Hall Gordon, Bell Laboratories and NBER

Barry Nalebuff, Harvard University, and Richard J. Zeckhauser, Harvard University and NBER, "Pensions and Labor Market Performance"

Discussant: Lawrence H. Summers, Council of Economic Advisers

Peter A. Diamond, MIT, and James A. Mirrlees, Nuffield College, "Insurance Aspects of Pensions"

Discussant: Robert C. Merton, MIT and NBER

Jerry R. Green, Harvard University and NBER, "Riskiness of Private Pension Plans"

Discussant: Alan J. Auerbach, Harvard University and NBER

Jeremy I. Bulow, Stanford University and NBER, and Wayne Landsman, Stanford University, "The Relationship between Wages and Benefits"

Discussant: Daniel Feenberg, NBER

Steven Kutner, Boston University and NBER, "Individual Attributes and Pension Acceptance Decisions: A Case Study"

Discussant: John B. Shoven

Herman B. Leonard, Harvard University, "The Federal Civil Service Retirement System: An Analysis of Its Financial Condition and Current Reform Proposals"

Discussant: Paul A. Samuelson, MIT

Ellwood's paper serves as an introduction to the key characteristics of pension plans that might influence labor market behavior and the possible magnitude of these influences. It begins by exploring both the individual and industrial characteristics that are most closely associated with pension coverage and receipt of a pension. The most striking finding in that section is that pension coverage is almost universal in unionized establishments and in large firms but is uncommon in other types of firms. Pension coverage is most common among persons with high incomes. Ellwood then examines which characteristics of pensions cause the greatest disparity between actual compensation, which includes the value of incremental pension accumulation, and measured earnings, which does not. Rules governing retirement, early retirement, and the accumulation of benefits can be very powerful financial incentives, both to remain with the firm until retirement age, and then to retire immediately.

The paper by Kotlikoff and Wise describes and summarizes pension benefit accrual rates under a large number of private pension plans. Benefit accruals at the time of vesting average approximately 15 percent of wage earnings but often exceed 50 percent of wage earnings for those whose vesting occurs late in their working lives. Changing jobs can have a substantial cost in pension benefits primarily because the implicit indexation of benefits to wage earnings is broken. Early retirement provisions typically entail a large reduction in the rate of benefit accrual at the early retirement age, but average accrual rates are rarely negative (only under extreme interest rate and wage growth assumptions). In sum, the evidence on pension accrual rates coupled with age-tenure wage profiles is strongly inconsistent with the spot market theory of labor compensation.

Freeman examines the role of trade unions in determining pension coverage, firm expenditures for pensions, the provisions of pension plans, and pension fund investments. He also considers the impact of union pensions on the age-earnings profile of union workers. Four basic findings emerge: (1) Unions greatly increase pension coverage and alter the determinants of coverage in ways that go beyond the monopoly wage effects of unionism. (2) Unions alter the provisions of pension plans in ways that benefit senior workers and that equalize pensions among workers. (3) Estimates of the age-earnings profile of union workers are seriously flawed

by failure to take account of the union impact on pensions, which generally enhance the earnings of the oldest groups. (4) Union pension funds can and do shun the stocks of nonunion firms without lowering the value of the portfolio.

Taubman uses the 1977 wave of the Retirement History Survey to examine the expected value of remaining lifetime pension wealth and differences in pension benefits. He estimates equations for the probability of having a pension, the dollar amount of the pension, and wealth, and he uses the estimates to evaluate the difference in wealth for various characteristics. *Ceteris paribus*, pension wealth differs with education, financial wealth, Social Security wealth, number of children, marital status, gender, and longest occupation but not with race (when these other variables are controlled).

Hausman and Wise consider two continuous-time statistical descriptions of the age of retirement. One is the well-known proportional hazard model; the other is based, on a Brownian motion diffusion process. The hazard model suggests a very substantial effect of Social Security payments or wealth on the age of retirement. A substantial portion of the drop in labor force participation of older workers between 1969 and 1975 can, in fact, be explained by the substantial increases in Social Security benefits over that period. Empirical results based on the Brownian motion model have not yet been fully developed; the primary complication in applying that model is that observed hours of work decline very little with age. Therefore the model must be specified in terms of desired hours of work.

The paper by Hurd and Shoven attempts to calculate the real rate of return that the current elderly have received from Social Security. They begin by calculating the present value of lifetime contributions to the Social Security system by a sample of the elderly and then find the present value of their expected benefits. The difference between the two is called Social Security transfers. Then, for each family in the sample, they calculate the internal rate of return to the retirement program. The primary results are that Social Security transfers and rates of return were very high for this population in 1969 and remained high throughout the decade. Further, the wealthy received the largest transfers; as now constituted, the Social Security system transfers much from average workers to the wealthy retired. Finally, Hurd and Shoven attempt to calculate how rates of return and transfers will evolve over the next 40–50 years.

Viscusi's paper provides a conceptual analysis of the role of pensions as an instrument of labor compensation. One focus is the use of pensions in situations in which workers face job-related uncertainties. Whenever these uncertainties have some dynamic aspect, such as in situations of learning or instances where the uncertainties evolve over time (for example, an outside job offer), pensions can serve as a valuable component of the wage compensation package if not all these benefits are transferable. In the absence of full portability or full vesting rights, workers who leave their jobs will sacrifice some of their pension benefit rights, and this

loss will diminish worker turnover. This paper shows that under a wide variety of circumstances, pensions can serve as an effective labor compensation mechanism for attracting more stable employees to the firm and for preventing turnover of workers after they begin employment at the firm. These results have attractive properties for workers who are fully informed of all of the various risks that they face but, if workers misperceive the risks, the role of pensions may be more controversial. In particular, firms then will have an incentive to use pensions to engage in unfair bets against the worker by placing a great reliance on pensions in situations in which workers overestimate the chance that they will remain at the firm and collect the pension benefits.

Lazear notes that many casual statements are made about the relationship between pension provisions and worker behavior, specifically, that employee turnover and incentives are often related to specific provisions of the pension formula. His paper analyzes the effects of particular pension provisions on worker behavior. In particular, it examines different types of pension plans (defined-benefit and defined-contribution plans) and specific terms of the pension that have to do with vesting and maximum and minimum benefits. Finally, it examines why seemingly inefficient pension provisions may be widespread.

The analysis by Nalebuff and Zeckhauser provides a framework for assessing the phenomenon of pensions influencing retirement decisions from both descriptive and normative viewpoints. The qualitative features of most defined-benefit pension plans in the United States, as the first section of their paper demonstrates, can be used to induce optimal retirement choices. Pensions are viewed as a form of forced saving; their purpose is to enable the worker to "commit himself" by making it in his own self-interest to retire at an appropriate age. The remaining sections of the paper examine the use of pensions in populations that are heterogeneous with respect to such features as disutility of work or expected life span. Given heterogeneity, a major policy concern is whether pensions are actuarially fair to different groups, retirement cohorts, and the like. An optimal pension plan cannot be more than fair actuarially in the sense that someone who retires later must impose a smaller cost on the pension pool than he would if he retired earlier. However, people who retire later are likely on average to live longer; under most common pension plans, late retirees impose a greater cost on the pension fund than those retiring earlier. Ideally, a separate pension plan would be designed for each group of workers; homogenization is shown to work to the possible detriment of workers as a whole. But overall, pensions are a workhorse compensation mechanism; they provide an additional instrument beyond wages for attracting, motivating, sorting, and retraining workers, while facilitating appropriate retirement decisions.

The paper by Diamond and Mirrlees analyzes the equilibrium long-term labor contract in the presence of mobility threats, exogenous mobility, and endogenous mobility. They consider various equilibriums with alternative

assumptions about the observability of outside offers. They focus their attention on when the optimal contract includes a transferable pension. The authors also discuss modeling approaches to pensions. In particular, they consider the role of reputation in affecting equilibrium when there are repeated wage negotiations.

Green states that the private pension contract is a complex specification of the payments to be made to a worker as they depend on his work history, wage history, age, health status, and perhaps on macroeconomic variables. Because of this complexity, the value of this contract is highly uncertain. It is difficult to compare different forms of the pension contract. Green's paper compares four different pension plans according to their risk characteristics. The principal difference among them is in the formula used to compute the retirement benefit. One plan is based on a career average of earnings, another on the earnings at the end of working years, another on a fixed percentage of final year's salary per year of service, and the fourth on a fixed dollar amount per year of service. Green finds that the plan based on the earnings at the end of working years provides the safest real retirement income. He also studies the correlation between pension benefits and lifetime earnings. This provides another measure of the riskiness of private pensions, because the lower the correlation, the more pensions offer some mitigation of risk over the life cycle. On this criterion as well, the same form of the plan proves safest.

Bulow and Landsman ask how a firm should choose the types of benefits it offers and how that choice affects the firm's different worker constituencies. They also consider the appropriate accounting method for different types of benefits and what the type of benefit implies about a firm. They suggest that the answer to such questions depends on one's model of the firm-employee relationship and go on to formulate both economic and noneconomic models of that relationship in terms of compensation. Finally, using Stanford University as an example, they find in preliminary work that an individual's pension compensation is not taken into account when setting the individual's wage even if overall pension compensation is taken into account when setting the overall wage scale.

Kutner notes that pension benefits are an important element of employee compensation, and participation in an employee pension plan will influence the retirement decisions of older workers. His paper examines the decisions by members of a state retirement system to accept a pension. Survey data on the personal and family characteristics of a sample from the largest teachers' retirement system in the nation are merged with benefit valuation data obtained from the retirement system.

Finally, Leonard analyzes the financial conditions of the civil service retirement system and considers a current proposal for major reform. The system has a very large unfunded liability—about half the size of the national debt. The reforms proposal would cut this debt by about one-fourth and would reduce the need for

taxpayer contributions considerably. But the reforms would also drastically reduce the pension benefits that federal workers have anticipated—the net pension wealth of current employees would be cut in half, or by over \$100,000 per employee.

In addition to the authors and discussants, NBER Executive Director David G. Hartman participated in the conference proceedings. The papers presented, and their discussions, are expected to be published in an NBER conference volume. Details of its availability will appear in a future issue of the *NBER Reporter*.

Working Meeting Held in Washington

On April 29 members of NBER's Trade Relations Project met in Washington with trade specialists from Congress, government departments, independent agencies, private research organizations, and universities for a working meeting on "Issues and Initiatives in U.S. Trade Policy, 1981-83." The informal conference was part of the Bureau's research on international economic policy sponsored by the National Science Foundation (NSF); the agenda was:

Introductory Remarks: Conference Cochairmen J. David Richardson and Robert E. Baldwin, University of Wisconsin

Chair: David R. Macdonald, Baker and McKenzie
Robert E. Baldwin, "Trade Policymaking at the Executive Branch Level"

Alfred Reifman and Raymond Ahearn, Library of Congress, "Congressional Attitudes toward Foreign Trade"

Harvey E. Bale, Jr., Office of the U.S. Trade Representative, "Trade-Related Investment Issues"

Chair: Isaiah Frank, Johns Hopkins University
Shannon S. Shuman, Coopers and Lybrand, and Charles O. Verrill, Jr., Patton, Boggs, and Blow, "Recent Issues in Countervailing Duty Law and Policy"

Walter Adams, Michigan State University, and Joel Dirlam, University of Rhode Island, "ITC Standards for Protection of Domestic Industry"

Panel Discussion: Claude Gingrich, Office of the U.S. Trade Representative, and Franklin Vargo, U.S. Department of Commerce, "Future U.S. Trade Policy Options"

The purpose of this meeting was an exchange of views and information on outlines of the preceding topics. A formal conference on the same subject was held in Cambridge on August 8 coincident with NBER's 1983 Summer Institute.

In addition to the authors, chairmen, and panel, participants included: Douglas L. Adkins, Congressional Office of Technology Assessment; C. Michael Aho, Senator Bradley's office; William E. Barreda, U.S. Treasury Department; Thomas O. Bayard, Ford Foundation; Beatrice Brickell, attorney with Graubart, Moskowitz, and McCauley; Asim Erdilek, Carole E. Kitti, and Rolf R. Piekarz, NSF; Ava S. Feiner, U.S. Chamber of Commerce; Lawrence A. Fox, National Association of Manufacturers; Gary Horlich, U.S. Department of Commerce; Gary Hafbauer and John H. Jackson, Institute for International Economics; Kent Hughes and William Reinsch, Senator Heinz's office; Irving B. Kravis, University of Pennsylvania and NBER; Robert E. Lipsey, Queen's College and NBER; Margaret McGregor, U.S. General Accounting Office; Richard Nygard, Office of Management and Budget; Jorge Perez-Lopez and Gregory Schoepfle, U.S. Department of Labor; Richard B. Self, Office of the U.S. Trade Representative; Emery Simon, Congressional Budget Office; John W. Suomela, U.S. International Trade Commission; and David Tarr, Federal Trade Commission.

The Economics of Trade Unions

Over one hundred economists from the United States, Canada, and the United Kingdom gathered in Cambridge on May 6 and 7 for a Universities Research Conference on "The Economics of Trade Unions" organized by Research Associate Daniel S. Hamermesh. The two-day agenda was:

Opening Remarks: Daniel S. Hamermesh, Michigan State University and NBER

SESSION I. UNIONS AND EMPLOYMENT

Chair: Richard B. Freeman, Harvard University and NBER

Jonathan Leonard, University of California, Berkeley, and NBER, "Unions and Equal Employment Opportunity"

Discussants: Charles Brown, University of Maryland and NBER; Duane Leigh, Washington State University

Jeffrey Perloff, University of California, Berkeley, and Robin C. Sickles, University of Pennsylvania and NBER, "FIML Estimation of Union Wage, Hours, and Earnings Differentials in the Construction Industry: A Nonlinear Limited Dependent Variable Approach"

Discussants: Peter Schmidt, Michigan State University; Lawrence Kahn, University of Illinois

SESSION II. WAGE EFFECTS

Chair: Albert E. Rees, Alfred P. Sloan Foundation

H. Gregg Lewis, Duke University and NBER, "Union Relative Wage Effects: A Survey"

Discussants: Henry S. Farber, MIT and NBER; Jody Sindelar, University of Chicago

Mark Stewart, University of Warwick and Princeton University, "The Estimation of Union Wage Differentials from Panel Data: The Problem of Not-So-Fixed Effects"

Discussants: Gary Chamberlain, University of Wisconsin and NBER; Donald O. Parsons, Ohio State University

George E. Johnson, University of Michigan and NBER, "Unionism in a Macroeconomic Context: An Exploratory Analysis"

Discussants: Frank Brechling, University of Maryland; Katharine G. Abraham, MIT and NBER.

SESSION III. UNION GOALS AND METHODS

Chair: Sherwin Rosen, University of Chicago and NBER

Peter Linneman and Pablo Spiller, University of Pennsylvania, "On Testing Unions' Motives"

Discussants: John Kennen, University of Iowa; James N. Brown, Princeton University and NBER

Henry S. Farber, "Right-to-Work Laws and the Extent of Unionization" (NBER Working Paper No. 1136)

Discussants: Ronald G. Ehrenberg, Cornell University and NBER; Walter J. Wessels, North Carolina State University

Richard Ruback and Martin B. Zimmerman, MIT, "Unionization and Profitability: Evidence from the Capital Market"

Discussants: James L. Medoff, Harvard University and NBER; Stephen Woodbury, Michigan State University

SESSION IV. STRIKES AND BARGAINING

Chair: Daniel S. Hamermesh

Drew Fudenberg, University of California, Berkeley, and David Levine and Paul Ruud, University of California, Los Angeles, "Strike Activity and Wage Settlements"

Discussants: Douglas Blair, Rutgers University; Jan Svejnar, Cornell University

George R. Neumann, Northwestern University, and Melvin W. Reder, University of Chicago, "Output and Strike Activity in U.S. Manufacturing: How Large Are the Losses?"

Discussants: Orley Ashenfelter, Princeton University and NBER; Joe A. Stone, University of Oregon

Leonard's paper presents evidence that the proportion of black males in unionized, blue-collar jobs in manufacturing in California increased between 1974 and 1980, and that more generally employment growth for blacks is related to the contract compliance efforts

of federal affirmative action programs. According to his analysis, increases for white females and for Hispanics in general are less apparent. His results are based on a unique establishment-level data set that includes reports filed by firms with the Equal Employment Opportunity Commission and with the Office for Federal Contract Compliance Programs.

The paper by Perloff and Sickles uses full-information, maximum-likelihood techniques on a simultaneous system of wage, hours, and earnings equations for the construction industry. The authors find that unions create positive wage effects greater than those estimated in earlier studies, and a small negative effect on hours. The net effect of unions on earnings is positive but smaller than their effect on wages.

In the second section, Lewis presented two chapters from his forthcoming book entitled *Union Relative Wage Effects: A Survey*. In one chapter he reviews papers that estimate union wage effects from panel data. Those estimates are generally smaller than estimates from OLS equations based on cross-section data. The latter, he concludes, are generally biased upward. In the second chapter, Lewis reviews estimates of wage effects of unions on different demographic groups and concludes that union wage effects are often, but not always, higher for low-wage groups than for others.

Stewart's paper includes estimates of union wage effects in which individual-specific intercepts are allowed to vary across union and nonunion status, industries, and firms. His estimates, obtained from the National Longitudinal Survey of Young Men, are compared with those of more standard fixed-effects models and are shown to be only slightly lower when all of the interactions are included.

Johnson's paper presents some simple macroeconomic models that incorporate various assumptions about union and nonunion wage-setting behavior. He then derives the implications of inflation and unemployment for union wage effects in each case. Finally, Johnson constructs a time series of union wage differentials and estimates the effects of unemployment and lagged inflation on these. He finds positive effects for both macroeconomic conditions.

In the third session, Linneman and Spiller presented their paper that distinguishes three general models of union behavior: labor monopoly, labor efficiency, and industry cartel. They hypothesize that the first two models imply optimal strike avoidance policies as functions of industry characteristics while the third implies randomness of strikes. They then estimate propensities to strike in the airline industry as functions of various airline characteristics and find that strikes seem to be random.

Farber's paper estimates equations for the demand for and supply of unionized jobs, and for wage differentials, in states with and without Right-to-Work laws. His results show that in states with these laws, the demand for unionism is lower than in states without them, but the supply of unionized jobs is not necessarily affected. Farber concludes that Right-to-Work laws may re-

flect lower tastes for unionism among residents and do not independently lower the number of unionized jobs available.

The paper by Ruback and Zimmerman tests for union effects on profits by analyzing the effects of both successful and unsuccessful union elections on subsequent returns to a company's stockholders. They find large negative effects of successful elections on stock returns, suggesting that unions do lower profitability.

The final session included a paper by Fudenberg, Levine, and Ruud that presents a model in which unions strike when they believe that firms' profits are higher than they really are; unions' expectations decline exponentially during the strike. The authors present empirical evidence in favor of this model showing negative relationships between strike durations and wage settlements and between strike durations and firms' sales revenues.

The paper by Neumann and Reder analyzes the relationship between strike activity and output in 63 manufacturing industries, finding that strikes lead to output losses in only 25 of them and that the losses in output are fairly small in magnitude. They conclude that participant costs of strikes may be higher, but substitution in production across firms and over time eliminates much of the cost at the aggregate industry level.

Macroeconomics Is Subject in Cambridge

Members and invited guests of NBER's Program in Economic Fluctuations met in Cambridge on July 7 and 8 for a conference on macroeconomics. The agenda, coordinated by Program Director Robert E. Hall of Stanford University, was:

Finn Kydland, Carnegie-Mellon University, "Nonseparable Utility and Labor Supply"

Discussants: Jerry R. Green, Harvard University and NBER; Robert Lucas, University of Chicago and NBER

John Kennan, University of Iowa, "An Econometric Analysis of Equilibrium Labor Market Fluctuations"
Discussants: Robert E. Hall; Julio J. Rotemberg, MIT and NBER

Alan C. Stockman, University of Rochester and NBER, "Aggregation Bias and the Cyclical Behavior of Real Wages"

Discussants: Alan S. Blinder, Princeton University and NBER; Robert Chirinko, Cornell University

Herschel I. Grossman, Brown University and NBER, and William Haraf, Brown University, "Shunto, Rational Expectations, and Output Growth in Japan" (NBER Working Paper No. 1144)

Discussants: Robert J. Gordon, Northwestern University and NBER; John Huizinga, University of Chicago and NBER

Andrew B. Abel and Olivier J. Blanchard, Harvard University and NBER, "Investment and Sales: An Empirical Study"

Discussants: Robert G. King, University of Rochester and NBER; Thomas J. Sargent, University of Minnesota and NBER

Arthur Rolnick, Federal Reserve Bank of Minneapolis, and Warren Weber, Virginia State University, "Gresham's Law or Gresham's Fallacy?"

Discussants: Fischer Black, MIT and NBER; Frederic S. Mishkin, University of Chicago and NBER

Stephen King, Stanford University, "Interest Rates and the Influence of Money on Output and Prices"

Discussants: Robert J. Shiller, Yale University and NBER; Lawrence H. Summers, Harvard University and NBER

Papers for the conference were selected by a steering committee headed by Robert Hall. Each member of the committee was responsible for recruiting one author or set of authors, working with the author to define the topic, and commenting upon the first draft. Members of the committee were Robert J. Barro, Stanley Fischer, Robert J. Gordon, Robert Lucas, Michael Parkin, Thomas J. Sargent, and Robert Solow.

The first day of the conference was devoted to issues involving labor markets and the macroeconomy. Kydland presented a theoretical paper that explores alternative approaches to analyzing intertemporal substitution in labor supply. He suggests a model in which consumers' utility in each period depends upon their leisure in both the current and previous periods. Kydland contrasts this specification with alternative models and notes several prospective sources of additional information on this issue. Panel data on individual wages, characteristics, and labor market choices seem to provide a promising direction for future study.

Kennan presented an analysis of past models of labor market equilibrium. His paper considers three separate equilibrium models with similar labor demand specifications but different approaches to labor supply. One model is derived from an intertemporally separable utility function; another relaxes this assumption; and the third embodies the notion of "wage smoothing." Kennan demonstrates that without strong identifying restrictions all three yield identical reduced-form models for the relationship between employment and real wages. This finding raises serious doubts about the ultimate "testability" of the intertemporal substitution hypothesis. Kennan imposes enough restrictions to enable him to estimate and compare the alternative specifications and focuses on their ability to explain the high degree of serial correlation typically observed in estimated labor market models. The results show how simple models behave and suggest directions for future work.

Because previous empirical studies that have explored the relationship between observed fluctuations in output and movements in wages have proved inconclusive, Stockman reexamines the intertemporal substitution hypothesis from two new perspectives. First,

he presents new evidence for procyclical wage patterns, drawing upon data for a longer period (1900-81) than earlier investigators. Second, he addresses the question of whether aggregate wage indicators, such as average hourly compensation, accurately reflect real wage movements over time. Using longitudinal data on individuals' labor market experience, he compares the variations in individual wage records with that in aggregate series. Stockman finds that wage indexes, such as average hourly compensation, do not fully reflect the procyclical movement of wages, principally because they do not adjust for variations in labor force composition during the business cycle.

Macroeconomists have long suspected that monetary policy could exert real influences on the economy by changing real wages during the life of labor contracts. Grossman and Haraf search for evidence in support of this proposition by considering the Japanese experience. Japanese data are well suited to testing this hypothesis because Shunto, the "spring labor offensive," places all wage bargaining at the same point in the calendar year. The authors assume that the wages that workers accept during the Shunto bargaining equal their rational expectations of the level of wages that would achieve target levels of real output. This allows them to model real output growth as dependent upon monetary surprises during the contract period. The results suggest that when nominal wages are fixed, changes in monetary policy and other shocks that occur between the Shunto and each month are important forces in driving real output patterns.

The second day of the conference focused more on financial and monetary issues. The paper by Abel and Blanchard studies the four main sources of lags in the response of investment expenditures to sales: costs of adjustment, delivery lags, order-expenditure lags, and expectational lags. To estimate a structural model and identify each of the four, the authors gather data on delivery lags, imposed restrictions on the order-expenditure lag, and assumed rational expectations of sales based on various information sets. When the information set includes only current and past values of a sector's sales, the structural model performs surprisingly well. For the information set containing aggregate sales as well, the structural model performs poorly, being unable to explain the relation—or the lack of relation—between investment in a sector and aggregate sales.

Gresham's law states that when market and legal prices of money differ, the bad money drives out the good. Rolnick and Weber argue that this claim is unconvincing because existing explanations imply unbounded profits for traders. Moreover, there are many overlooked exceptions to the law. The authors make two claims about what happens when legal and market money prices differ: (1) the money overvalued at the mint becomes the unit of account (that is, circulates at par) and (2) small-denomination money (for example, money less than one dollar), undervalued at the mint, tends to disappear from circulation while large-denomination, undervalued money usually circulates at a

premium. They cite historical evidence to support these assertions.

In the final paper of the conference, King aims at distinguishing between the hypotheses of "real" versus "monetary" causes of business fluctuations under three different operating procedures of the Federal Reserve Board. Using reduced-form analysis, he finds that the monetary base is almost totally unrelated to output variation but not price variation. The extent of monetary endogeneity declines in his sample and disappears after 1979, but the influence of bank money on output remains strong.

NBER associates who participated in the conference included: Jeremy I. Bulow of Stanford University and James M. Poterba of MIT who acted as rapporteurs; Alan J. Auerbach, Benjamin M. Friedman, Zvi Griliches, and Jeffrey Sachs, Harvard University; Robert J. Barro, Dennis W. Carlton, Alan Drazen, and Victor Zarnowitz, University of Chicago; Ben S. Bernanke, Stanford University; Zvi Bodie, Boston University; Michael Bordo, University of South Carolina; Stanley Fischer and Jerry A. Hausman, MIT; Robert P. Flood, University of Virginia; Roger H. Gordon, Bell Labs; Fumio Hayashi, University of Tsukuba; Robert Hodrick, Northwestern University; Takatoshi Ito, University of Minnesota; Kenneth Singleton, Carnegie-Mellon University; and Anna J. Schwartz.

Other participants were: Lorne Carmichael, Queen's University; Larry Christiano, University of Chicago; Richard Clarida and Russell Cooper, Yale University; Behzad Diba and Steve Green, Brown University; Benjamin Eden, Gary Fethke, and Charles Whiteman, University of Iowa; Jo Anna Gray, Federal Reserve Board of Governors; Jeremy Greenwood, University of Western Ontario; Douglas Hibbs, Harvard University Department of Government; and Kenneth West, Princeton University.

Organizations wishing to have meetings listed in the Conference Calendar should send information, comparable to that given below, to Conference Calendar, National Bureau of Economic Research, 1050 Massachusetts Avenue, Cambridge, MA 02138. Please also provide a short (fewer than fifty words) description of the meetings for use in determining whether listings are appropriate for inclusion. The deadline for receipt of material to be included in the Fall 1983 issue of the *Reporter* is October 1. If you have any questions about procedures for submitting materials for the calendar, please call Kirsten Foss at (617) 868-3900.

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

October 14-15, 1983
The Economics of the U.S. Retirement Income System, NBER

October 21-22, 1983
Policy Options for Catastrophic Personal Injury, Hoover Institution

October 27-28, 1983
Program Meeting: Taxation, NBER

November 18-20, 1983
Conference on Public Policy, Carnegie-Rochester

December 2-4, 1983
Aggregate Implications of Price Setting and Contract Models, NBER/CEME

December 7-10, 1983
Income and Wealth: Horizontal Equity, Uncertainty, and Measures of Well-Being, NBER

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

January 4-6, 1984
International Meeting, International Association of Energy Economists

January 4-7, 1984
Global Implications of Trade Patterns of Asia, NBER

January 19-20, 1984
Program Meeting: Taxation, NBER

January 19-21, 1984
Program Meeting: Development of the American Economy, NBER

February 9-10, 1984
General Equilibrium Workshop, NBER

March 16-17, 1984
Public Pensions, NBER

March 22-24, 1984
Income and Wealth: Long-Term Factors in American Economic Growth, NBER

March 22-25, 1984
Conference on Business Cycles, NBER

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

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.**

April 5-6, 1984

Panel on Economic Activity, Brookings Institution

April 13-14, 1984

Conference on Public Policy, Carnegie-Rochester

May 21-22, 1984

Spring Symposium, National Tax Association*

June 11-15, 1984

Interlaken Seminar on Analysis and Ideology, University of Rochester

June 18-22, 1984

Konstanz Seminar on Monetary Theory and Monetary Policy, University of Rochester

June 24-28, 1984

Annual Meeting, Western Economic Association

August 5-8, 1984

Annual Meeting, American Agricultural Economics Association

August 13-16, 1984

Annual Meeting, American Statistical Association*

September 13-14, 1984

Panel on Economic Activity, Brookings Institution

September 23-25, 1984

Annual Meeting, National Association of Business Economists*

November 14-16, 1984

Annual Meeting, Southern Economic Association*

November 25-28, 1984

Annual Conference, National Tax Association*

December 28-30, 1984

Annual Conference, American Economic Association*

August 4-7, 1985

Annual Meeting, American Agricultural Economics Association

August 12-15, 1985

Annual Meeting, American Statistical Association*

September 29-October 2, 1985

Annual Meeting, National Association of Business Economists*

December 28-30, 1985

Annual Conference, American Economic Association*

July 27-31, 1986

Annual Meeting, American Agricultural Economics Association

September 13-17, 1986

Annual Meeting, National Association of Business Economists*

September 27-October 1, 1987

Annual Meeting, National Association of Business Economists*

Bureau News

Program Meeting on Taxation

A variety of issues in taxation was discussed on April 28-29 when members and guests of NBER's Program in Taxation, directed by David F. Bradford of Princeton University, met in Cambridge. The agenda was:

Charles Clotfelter, Duke University and NBER, "Recent Work on Tax Policy and Charitable Giving"
Discussant: Daniel Feenberg, NBER

Lawrence H. Goulder (joint work with Charles Ballard), Harvard University, "Tax Policy and Consumer Foresight: A General Equilibrium Simulation Study"
Discussant: John Shoven, Stanford University and NBER

Roger H. Gordon, Bell Laboratories and NBER, and Joel Slemrod, University of Minnesota and NBER, "General Equilibrium Simulation Study of Subsidies to Municipal Expenditures"
Discussant: Daniel J. Frisch, Council of Economic Advisers

Alan J. Auerbach, Harvard University and NBER, "The Dynamic Effects of Tax Law Asymmetries"
Discussant: Joseph E. Stiglitz, Princeton University and NBER

Christophe Chamley (joint work with Brian Wright), Yale University, "Fiscal Incidence in a Dynamic Life-Cycle Model with Land"
Discussant: Michael Rothschild, University of Wisconsin and NBER

Luncheon: James Wetzler, Chief Economist of the Joint Committee on Taxation, on current federal tax issues

Jonathan Skinner, University of Virginia, "Variable Life Span and the Intertemporal Sensitivity of Consumption"
Discussant: Lawrence H. Summers, Council of Economic Advisers

Mervyn A. King, University of Birmingham and NBER, "An Empirical Analysis of Tax Changes with Heterogeneous Preferences"
Discussant: James M. Poterba, MIT and NBER

Clotfelter reported on a project that examines the effect of federal taxes on donations by individuals and corporations, charitable bequests, and volunteering. For each of these types of charitable behavior, Clotfelter's paper discusses both the tax treatment and the econometric evidence regarding the effect of taxation. The work provides new estimates of tax effects for volunteering and corporate contributions and presents

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

simulations of various tax policies. Clotfelter finds that volunteering is influenced by taxation through tax effects on the work effort and through a cross-price effect of the price of making donations in cash. He further finds that corporate contributions are relatively inelastic with respect to the net-of-tax price of gifts.

In the paper by Goulder, the assumptions of myopia and of perfect foresight define polar cases of the availability of information about the future. His paper develops a consistent general equilibrium model in which the amount of information available can vary systematically within these extremes. He also reports and interprets the results of simulations of various tax policies under different specifications of the amount of foresight that consumers have. One of his main findings is that the social value of additional foresight can be negative: more foresight can lead to capital deepening and a declining relative price of capital over time. To the extent that consumers have more foresight, they become better able to anticipate these declines in capital prices and they lower their estimation of the rate of return to capital. Therefore, they save less. In a second-best world where, because of taxes on capital, the marginal value of saving exceeds that of consumption, the reduction in saving leads to lower welfare.

The paper by Gordon and Slemrod theoretically explores and then empirically simulates the effects of eliminating either of two federal subsidies that encourage local government expenditures: (1) income tax deductibility of local tax payments, and (2) the tax exempt status of interest on municipal bonds. They find that eliminating the deductibility of local taxes raises the utility of all groups studied, while making interest on municipal bonds taxable substantially hurts the very rich, who lose a tax shelter, and may hurt the very poor, who pay more for municipal services.

Auerbach's paper explores the investment incentives imposed by two tax systems that are "neutral" except for the asymmetric treatment of gains and losses. Among the findings are: (1) a cash flow tax and an income tax with full deductibility exert very different effects on investment behavior; (2) under an income tax, "less efficient" firms with higher fixed costs will be observed to invest more than more efficient firms, because of the greater tax shield provided by previous losses carried forward; (3) under a cash flow tax, firms with sufficient taxable income to deduct current investment costs will invest more than they would in the absence of taxation; and (4) differences in firm characteristics can provide government with a mechanism for altering relative investment levels through a self-selection process. These results are related to the recent legislative debate over the implicit sale of depreciation deductions through "safe-harbor" leasing.

Chamley analyzes various fiscal policies in a life-cycle model of general equilibrium where land is a fixed factor of production. His emphasis is on the initial impact of tax reform on the price of land in a context of perfect foresight. Some of the results are independent of the technology of the utility function, at least in the stylized

framework. He cannot, in general, exclude a positive impact of an uncompensated land-rent tax on the price of land, but the capital gain is always smaller than one-half of the land tax revenues per generation. Under reasonable conditions, the land-rent tax induces a long-run increase in the capital stock; this effect is similar to the Tobin effect of inflation in a monetary economy. Other compensation schemes, and taxes on the price of land, are also investigated. For example, a transfer from the young to the old (Social Security) has a negative impact on the price of land, which reduces the magnitude of the net transfer induced by the program. In extreme cases, the net transfer could be negative even for the first generation of recipients.

Skinner, whose presentation followed the informative luncheon discussion, focused on the central role of the interest rate in the determination of consumption and saving. His paper uses the equivalence between the effect of the interest rate and the effect of mortality probabilities on consumption to gain an estimate of the intertemporal elasticity of consumption. He uses the seemingly unrelated regression method in a cross-sectional model of consumption, earnings, and assets to provide efficient estimates of the intertemporal parameter. His econometric results suggest that the interest elasticity is somewhat higher than estimates from previous studies.

Finally, King discusses the increasing use being made of large microdata sets to examine the impact of tax reform proposals on a cross-section of households. These data clearly show the heterogeneity of the population and misleading nature of conclusions drawn from data for one or a small number of "representative" households. One important source of the heterogeneity is variation in tastes (for consumption rather than leisure, for example), and this phenomenon has been incorporated into econometric specifications. The contribution of King's paper is to use individual-specific effects to make inferences about the distribution of gains and losses among the population. Taking the example of tax subsidies to housing in the United Kingdom, King shows that both the mean gain (change in deadweight loss) and the distributional effects of a reform to eliminate subsidies can be estimated more efficiently by allowing for heterogeneous preferences.

In addition to those on the program, participants at the two-day meeting included: Fischer Black and Jerry A. Hausman, MIT and NBER; Larry L. Dildine, U.S. Department of the Treasury; Jerry R. Green, Harvard University and NBER; David G. Hartman, NBER; Patric H. Hendershott, Ohio State University and NBER; Peter Mieszkowski, Rice University and NBER; Harvey S. Rosen, Princeton University and NBER; Daniel L. Rubinfeld, University of Michigan Law School, and Emil Sunley of Deloitte, Haskins, and Sells.

Financial Economists Meet

Members of NBER's Program in Financial Markets and Monetary Economics, directed by Benjamin M. Friedman of Harvard University, met in Cambridge on May 5 and 6 to discuss their recent work. The following papers were presented:

Zvi Bodie, Alex Kane, and Robert McDonald, Boston University and NBER, "Are Real Interest Rates Too High?" (NBER Working Paper No. 1141)

Discussant: Carl E. Walsh, Princeton University and NBER

Robert Lucas, University of Saskatchewan, "Financial Innovation and the Control of Monetary Aggregates: Some Evidence from Canada"

Discussant: Charles Freedman, Bank of Canada and NBER

Richard Clarida, Harvard University, and Benjamin M. Friedman, "Why Were Short-Term Real Interest Rates So High?"

Discussant: Takatoshi Ito, University of Minnesota and NBER

John Campbell, Kermit Schoenholtz, and Robert J. Shiller, Yale University and NBER, "Toward Rates and Future Policy: Interpreting the Term Structure of Interest Rates"

Discussant: Olivier J. Blanchard, Harvard University and NBER

Patric H. Hendershott, Ohio State University and NBER, "The Determination of Home Mortgage Rates: Empirical Results for the 1975-81 Period"

Discussant: V. Vance Roley, Federal Reserve Bank of Kansas City and NBER

The paper by Bodie, Kane, and McDonald applies the Capital Asset Pricing Model to the anomalous behavior of real interest rates during the last several years. Specifically, the authors are able to show that the increased volatility of bond prices since the Federal Reserve System's policy switch in October 1979 has substantially increased the required real risk premium on long-term bonds. They consider and reject, however, the possibility that increased risk alone accounts for the recent increase in the short-term real rate. Finally, they show how their model can be used to simulate the financial effects of a federal debt management operation.

Lucas's paper presents an empirical test of the proposition that control of a monetary aggregate will generate a rise in its velocity. The test is carried out using the Canadian experience of controlling M1 growth from 1975:3 to 1982:3. The first section of the paper presents evidence of instability of the Canadian demand for M1 money since 1975:3. The second section develops a specific form of the proposition emphasizing the role of asset substitution between classes of chartered bank deposits. Lucas derives an equation for relative asset demands from a wealth maximization model subject to a technological constraint on transac-

tions. He then estimates this equation from 1961 through 1982. The results lend support to the proposition that central bank control of M1 generated a rise in the velocity of M1.

The paper by Clarida and Friedman seeks to discover the source of extraordinarily high short-term real interest rates that the U.S. economy has experienced since late 1979. (The analysis focuses on short-term rates to avoid the problem of having to infer market participants' expectations of inflation over long time horizons.) The authors document the shift in real interest rate levels that has occurred in this period. However, their analysis, based on vector autoregression methods, does not associate this shift with comparable shifts in the behavior of other key variables that might plausibly be related to interest rates, such as real economic activity, price inflation, money, credit, and the federal government's high-employment deficit. In the end, the authors argue that most of the familiar macroeconomic explanations for the high level of short-term real interest rates do not describe the data. Instead, this phenomenon is an "eccentric" development associated with aspects of the economy's behavior with regard to setting interest rates, including such elements as portfolio preferences and risk perceptions.

Shiller and his coauthors ask why long-term interest rates are so high now and why those rates have generally responded positively to announcements of unexpected increases in the stock of money. The answers may be found in the pattern of expected future short-term interest rates implied by policy or, alternatively, in the "risk premium" applied to long-term rates. They conclude that the simple expectations theory of the term structure fits the data so badly that the high long-term rates might well be attributed entirely to the risk premium. In addition, higher interest rates have reduced the duration of long-term bonds, thus changing the typical pattern of long-short spreads.

Hendershott observes that mortgage rates rose sharply relative to yields on Treasury securities between early 1979 and early 1982. For GNMA pass-throughs and FHLMC participation certificates, the increase, appropriately measured, was nearly 1.5 percentage points; for new mortgage commitments, the increase was nearly 2.5 percentage points. Hendershott attributes the relative increase in yields on mortgage-backed securities to a combination of the greater value of the call option when interest rate volatility rises and the heavier taxation of mortgages when interest rates increase. The additional percentage point increase in the yields on mortgage commitments seems to reflect an increase in origination profits.

Other NBER program members who participated in the meeting were: Andrew B. Abel, Harvard University; Edward J. Kane, Ohio State University; Robert Pindyck, MIT; Robert H. Rasche, Michigan State University; and Paul Wachtel, New York University.

Business Cycle Group Meets

The Bureau's Business Cycle Dating Committee met in Cambridge on July 7 and identified November 1982 as the trough of the recession that had begun in the United States in July 1981. The trough signifies both the end of a recession and the beginning of a recovery or business expansion.

In reaching the judgment that an economic expansion was under way, the committee noted that output and sales in the United States had either nearly reached or exceeded levels they had achieved before the onset of the recent recession. For example, real gross national product in the first quarter of 1983 was only 1.5 percent below its peak, and preliminary indications were that further growth to midyear was substantial. Real retail sales, which declined by 4.9 percent during the recession, had already well exceeded their prerecession peak. Other measures of output and sales, especially outside the goods industries, had also shown solid growth since late 1982. Total employment began to recover sharply in the spring of 1983 and was almost back to its prerecession peak at the time of the meeting. The committee also strongly emphasized that the expansion has been extending throughout the economy in recent months and is now widespread.

The selection of November as the trough month reflected the central tendency of the turning points in a number of individual series. For example, real personal income and real manufacturing and trade sales both bottomed in October. Industrial production and employee hours worked at nonfarm establishments both reached their low in November. Employment at nonfarm establishments reached its low, and the total unemployment rate its high, in December.

In terms of the corresponding quarterly chronology, the committee identified the final quarter of 1982 as the trough quarter. The previous quarterly peak occurred in the third quarter of 1981, they determined. The recession's 16-month length was equal to that of the November 1973 to March 1975 recession. Each was longer than any other recession in U.S. experience since World War II.

Committee members are: William H. Branson, Princeton University (who did not attend the meeting); Benjamin M. Friedman, Harvard University; Robert J. Gordon, Northwestern University; Robert E. Hall, chairman, of Stanford University; Geoffrey H. Moore, Columbia University; Eli Shapiro, NBER president; and Victor Zarnowitz, University of Chicago.

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New Feldstein Volume Out

Behavioral Simulation Methods in Tax Policy Analysis, an NBER conference volume edited by Martin Feldstein, is now available from the University of Chicago Press at a cost of \$47.00. The volume includes thirteen papers and commentaries presented at a Bureau conference in the winter of 1981.

These studies are the first product of an ongoing project on how changes in tax rules affect economic behavior. The authors develop simulation models that extend previous research. In the past, calculations viewed individual pretax income and expenditure as fixed; this work incorporates behavioral responses to tax changes. For example, the papers consider how changes in the treatment of working wives' incomes, or the deductibility of charitable gifts, may affect economic behavior.

The work also expands the role of computational, general equilibrium models that analyze the long-run effects of tax changes on the economy as a whole. This is a new and important area for economic exploration. Martin Feldstein is currently on leave from Harvard University and is chairman of the President's Council of Economic Advisers. He was president of NBER from 1977 to 1982.

Dornbusch Volume Available

Financial Policies and the World Capital Market: The Problem of Latin American Countries, an NBER conference volume edited by Pedro Aspe Armella, Rudiger Dornbusch, and Maurice Obstfeld, became available from the University of Chicago Press in August for \$36.00. The papers in this book deal with the macroeconomic problems of the industrializing Latin American economies, and in particular with the interplay between their domestic policies and international financial markets.

Although diverse in subject and treatment, the papers share a common analytical approach. This shared methodological framework is applied to such problems as choosing the appropriate level of external debt, understanding the causes and costs of "dollarization," and estimating the response of capital flows to domestic stabilization measures. Although this particular volume deals only with Latin America, its approach is applicable to other countries as well.

Darby/Lothian Monograph This Winter

The International Transmission of Inflation, an NBER monograph, will be available in December from the University of Chicago Press. The team of authors, led by Michael R. Darby and James R. Lothian, includes Arthur E. Gandolfi, Anna J. Schwartz, and Alan C. Stockman. They construct a unique quarterly database for 1955-76 for eight countries: the United States, United Kingdom, Canada, France, Germany, Italy, Japan, and the Netherlands. They then design a model for using the data to test recent developments in international economics, such as the linkages that spread inflation from country to country in the 1970s.

They find, for example, that monetary growth was the major determinant of world inflation during 1957-76. Oil prices and other special factors accounted for only a minor fraction of the inflation. Moreover, monetary policy in the United States was the prime cause of accelerating money growth abroad, while international events played little if any role in determining U.S. money growth over any substantial period of time. The major channel of influence for U.S. monetary policy was the balance-of-payments effect of the substitution of goods for securities.

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Optimal and Time-Consistent Policies in Continuous-Time Rational Expectations Models

Willem H. Buiter
Technical Working Paper No. 29
August 1983
JEL Nos. 213, 133

In this note, the method of Hamiltonian dynamics is used to characterize the time-consistent solution to the optimal control problem in a deterministic, continuous-time rational expectations model. A linear-quadratic example based on the work of Miller and Salmon is used for simplicity. To derive the time-consistent rational expectations (or subgame-perfect) solution, I first characterize the optimal solution made familiar, for example, through the work of Calvo. I then obtain the time-consistent solution by modifying the optimal solution through the requirement that the co-state variables (shadow prices) of the nonpredetermined variables be zero at each instant. Existing solution methods and computational algorithms can be used to obtain the behavior of the system under optimal policy and under time-consistent policy.

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Journal of Economic Literature (JEL) subject codes, when available, are listed after the date of the Working Paper. Abstracts of all Working Papers issued since March 1983 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.

The New Nexus among Trade, Industrial, and Exchange Rate Policies

J. David Richardson
Working Paper No. 1099
March 1983
JEL Nos. 422, 431

This paper explores the new interconnections between real and financial policies that affect international transactions. Among the conclusions are:

(1) In a world of spatially mobile capital and reasonably accurate expectations, trends in international competitiveness and yields on financial assets are tightly linked. Volatility in one causes volatility in the other; policies that affect one affect the other. Financial policy influences real exchange rates and alters the pressures for trade and industrial policy. Trade and industrial policy causes overshooting of financial variables and alters the pressures for financial policy.

(2) Any failure to make real and financial policy stable, credible, systematic, and predictable generates volatile and costly signals to reallocate resources. The problems with this are more unpredictability than inefficiency and resource disorder rather than resource misorder.

(3) Stable, credible, systematic, and transparent exchange rate policy can allay resource disorder by limiting deviations around economic trends. Economic trends can be enhanced in the presence of well-defined market imperfections by stable, credible, systematic, and transparent trade and industrial policies.

(4) To reduce the likelihood of global resource disorder, real and financial policy options may involve retreating from multilateralism and from unrealistically binding rules. Sensible and timely alternatives seem to be aggressive bilateral peacemaking, noninclusive formation of coalitions, and the formation of credible "conventions" to govern government policy, both real and financial.

Intemporal Price Speculation and the Optimal Current-Account Deficit

Maurice Obstfeld

Working Paper No. 1100

March 1983

JEL No. 431

This paper studies the effects of fluctuations in the terms of trade in an infinite-horizon optimizing model of a small open economy. While the current-account response to a transitory shock to the terms of trade is explicable in part by intertemporal smoothing, an important additional factor is the effect of anticipated future shifts in the terms of trade on the real value of the external debt in terms of the home consumption basket. When foreign borrowing is indexed to the import good, a temporary worsening of the terms of trade creates the expectation of a decline in the real value of external debt. This fall in the relevant real interest rate leads households to increase consumption while export prices are low and to decrease consumption sharply once the terms of trade recover. If an adverse shock is of sufficiently brief duration, instantaneous utility will rise initially.

Trade in Goods and Factors with International Differences in Technology

James R. Markusen and Lars E. O. Svensson

Working Paper No. 1101

March 1983

JEL Nos. 411, 441

Using techniques of duality theory, we develop a general model of trade caused by international differences in production technology. For the case of product-augmenting differences in technology, we show that there is a positive correlation between net export and technological superiority, such that a country will "on average" export goods for which that country has superior technology. If some factors are permitted to be traded internationally, we demonstrate via this correlation, then the volume of trade must increase. Thus, unlike trade caused by differences in factor endowment, goods trade caused by product-augmenting differences in production technology is always, in this sense, complementary with factor trade. For factor-augmenting technology differences, in the absence of factor trade, the goods trade pattern is as if it were caused by differences in factor endowment. With factor trade, goods trade and factor trade then can be either complements or substitutes.

Taxes and Labor Supply

Jerry A. Hausman

Working Paper No. 1102

March 1983

Over 75 percent of federal tax revenue is raised through the income tax and FICA taxes. The potential effects on labor supply and economic welfare are important because of the large and increasing reliance on direct taxation. Over the past few years significant legislative changes have occurred with respect to taxation of labor: the 25 percent tax cuts, indexation, the tax credit for working spouses, and likely increases in FICA taxation. I review recent econometric work that measures the effect of taxes on labor supply and that analyzes the likely effects of tax law changes on labor supply and economic welfare.

Sections 1 and 2 develop the theory and econometric techniques for models of labor supply with taxes. Section 3 discusses the various tax systems in the United States. In Section 4, I present empirical estimates for husbands' and wives' labor supply functions and estimate the economic cost of the tax system. In Section 5 the individual questionnaire data for high-income individuals are reviewed. Finally, in Section 6 evidence from the negative income tax experiments and for Social Security beneficiaries is considered. These latter groups face extremely high marginal tax rates so that evidence beyond that contained in other surveys of labor supply is provided.

Balance-of-Payments Crises and Devaluation

Maurice Obstfeld

Working Paper No. 1103

April 1983

JEL No. 431

The collapse of a fixed exchange rate is typically marked by a sudden balance-of-payments crisis in which "speculators," fleeing from the domestic currency, acquire a large portion of the central bank's foreign exchange holdings. Faced with such an attack, the central bank often withdraws temporarily from the foreign exchange market, allowing the exchange rate to float freely before devaluing and returning to a fixed-rate regime. This paper links the timing of the initial speculative attack to the magnitude of the expected devaluation and to the length of the transitional period of floating. An implication of the analysis is that there

exist devaluations so sharp and transition periods so short that a crisis must occur the moment the market first learns that the current exchange parity will eventually be altered. For sufficiently long transition periods, the floating exchange rate "overshoots" its new peg before appreciating back toward it; for shorter periods, the rate depreciates monotonically to its new fixed level. Accordingly, the central bank's return to the foreign exchange market can occasion a capital outflow or a capital inflow.

Characteristics of U.S. Manufacturing Companies Investing Abroad and Their Choice of Production Locations

Irving B. Kravis, Robert E. Lipsey, and Linda O'Connor
Working Paper No. 1104
April 1983
JEL Nos. 441, 442, 600

The purpose of this paper is to examine the relations among characteristics of U.S. firms, their tendency to invest abroad, and their choice of production locations. The larger the firm and the higher its profitability, capital intensity, technological intensity, and the skill level of its labor force, the higher is the probability that it was a foreign investor. Some of these factors were largely associated with the nature of the firm's industry; but, within individual industries, size, R and D, and profitability were characteristics of investing firms.

Despite its importance in determining the probability that a firm would invest abroad, size of firm appeared to have no relation to the importance of foreign investment. Among firms that invested at all, large firms did not produce a higher proportion of their output abroad than small firms did. The concentration of manufacturing abroad in a small number of companies is largely a reflection of the concentration within the United States. The influence of size, we conclude, reflects economies of scale not in production but in investing.

We found no evidence that, in general, low-wage U.S. firms tended to invest in low-wage countries or that R and D-intensive firms tended to operate more in countries with highly sophisticated or educated labor. In fact, investors in developing countries, and particularly those in some Southeast Asian countries, tended to be more R and D intensive than investors in developed countries. There was some indication that in industries other than machinery, R and D-intensive firms were more inclined than others to license technology. In the machinery industries, R and D-intensive firms tended to license less: to exploit their technological capital in foreign markets by producing there rather than by licensing.

A Relationship between Regression and Volatility Tests of Market Efficiency

Jeffrey A. Frankel and James Stock
Working Paper No. 1105
April 1983
JEL No. 313

Volatility tests are an alternative to regression tests for evaluating the joint null hypothesis of market efficiency and risk neutrality. A comparison of the power of the two kinds of tests depends on what the alternative hypothesis is taken to be. By considering tests based on the bounds of conditional volatility, we show that if the alternative is that one could "beat the market" using a linear combination of known variables, then the regression tests are at least as powerful as the conditional volatility tests. If the application is to spot and forward markets, then the most powerful conditional volatility test turns out to be equivalent to the analogous regression test in terms of asymptotic power. In other applications, the volatility test will be less powerful than regression tests against our chosen alternative. However, these results are not inconsistent with the observation that volatility tests may be more powerful against other alternative hypotheses: for example, that risk-averse investors are rationally maximizing the present discounted utility of future consumption with a time-varying discount rate.

On the Relevance or Irrelevance of Public Financial Policy: Indexation, Price Rigidities, and Optimal Monetary Policies

Joseph E. Stiglitz
Working Paper No. 1106
April 1983
JEL No. 323

This paper is concerned with delineating conditions under which public financial policies have no real and/or price effects. In the absence of intergenerational distribution effects, public financial policy is irrelevant: an increase in government debt (whether indexed or not), an exchange of an indexed bond for a nonindexed bond, or an exchange of a short-term bond for a long-term bond has neither real nor financial effects. I also describe changes in financial policy in which the supply of bonds is increased and the nominal interest rate increases, which have an effect on the rate of inflation, but no real effects. I examine the implications of price and wage rigidities and the existence of a noninterest-bearing financial asset used for transactions purposes for the validity of these irrelevance theorems.

In general, public financial policies have effects on intergenerational distribution; alternative financial policies have implications for the pattern of capital accumulation (an effect that was the center of the literature on money and growth) and on the sharing of risks among members of different generations. I examine the consequences of three alternative financial policies: a fixed supply of financial assets, a fixed price level, and a fixed real supply of government indebtedness. Under some plausible conditions, the latter policy may provide for the least intergenerational variability in consumption.

Adjustment to Monetary Policy and Devaluation under Two-Tier and Fixed Exchange Rate Regimes

Joshua Aizenman
Working Paper No. 1107
April 1983
JEL No. 430

The purpose of this paper is to determine whether a two-tier exchange rate regime is more effective than a fixed-rate regime in increasing a country's ability to pursue an independent monetary policy in the short run. The analysis compares adjustment to a monetary policy and to a devaluation in the two exchange rate regimes in a portfolio model under imperfect asset substitutability. I show that in the short run the two policies have larger effects on interest rates under a two-tier regime. The duration of these effects, however, is longer under a fixed-rate regime. I then conduct the analysis for the case of static and rational expectations, demonstrating that the above results do not depend on the expectation mechanism.

Wage Flexibility and Openness

Joshua Aizenman
Working Paper No. 1108
April 1983

This paper analyzes the degree of short-run, real wage flexibility in a two-sector economy under floating rates. This is done by deriving optimal wage indexation in a contracting framework. I find that the more closed the economy, the lower the degree of wage indexation. As a result, output will fluctuate less around its desired level in a more closed economy. These findings further imply that a given unexpected monetary shock will cause a smaller output shock in a more open economy, whereas a given real shock will induce a smaller output shock in a more closed economy.

Survey Response Variation in the Current Population Survey

James M. Poterba and Lawrence H. Summers
Working Paper No. 1109
April 1983
JEL Nos. 821, 824

This paper investigates the problem of response and coding errors in the Current Population Survey (CPS). It draws upon a potentially rich source of information for verifying survey answers, a three-month matched sample of CPS respondents, to analyze whether individuals' questionnaire responses in adjacent months are mutually consistent.

We focus primarily on reported durations of unemployment spells. For individuals who were coded as unemployed in two consecutive months and who experienced no intervening labor market withdrawal or employment, their reported duration in the second interview should exceed the first interview duration by about four weeks. However, this is not what CPS responses show. In more than three-quarters of all cases, reported durations in successive months are logically inconsistent. The reporting problem is not confined to spell durations. In 25 percent of all cases, the professed reason for unemployment changes as the unemployment spell progresses. Furthermore, analysis of labor force entrants shows that reported changes in labor force status between unemployment and "out of the labor force" are not reliable guides to actual behavior.

We conclude that reported durations of unemployment, and to a lesser extent, reasons for unemployment, may be very misleading indicators of future behavior. Econometric analyses that focus on changes in individual behavior over time are likely to be badly flawed by spurious changes resulting from reporting errors. These problems with the CPS, one of the best sample surveys available, may suggest far greater difficulties in interpreting other sources of panel data.

The Desirability of a Dollar Appreciation, Given a Contractionary U.S. Monetary Policy

Jeffrey A. Frankel
Working Paper No. 1110
April 1983
JEL No. 431

Undesirable real effects have been attributed to floating exchange rates in general and the 1980-83 appreciation of the dollar in particular. In the appreciating country, the United States, export industries lose competitiveness and output falls. In the other country, which I label "Europe," the exchange rate worsens inflation.

This paper starts from the premise that these undesirable side effects are attributable not to the exchange rate but rather to the decision in the United States to switch to a more contractionary monetary policy in order to fight inflation. Given the U.S. contraction, it might be desirable for the dollar to appreciate in the sense that it allows each country to attain the best possible trade-off between aggregate output and inflation. This conclusion follows from the assumption that, in each of two sectors, nontraded goods or exportables, the relationship between output and inflation is concave. A U.S. contraction will then give the maximum reduction in inflation per lost output only if it is shared equally by both sectors. This means allowing the currency to appreciate; under a fixed exchange rate the burden of contraction would be borne disproportionately by the nontraded goods sector. The exchange rate change is also good for Europe. Given the U.S. contraction, the European export sectors would suffer a disproportionate loss in output if European currencies were not allowed to depreciate against the dollar.

Uncertain Parameter Values and the Choice among Policy Options

Don Fullerton and Andrew B. Lyon

Working Paper No. 1111

April 1983

JEL No. 320

In this paper, we use tax policy choices to illustrate and investigate the more general problem of using uncertain parameter values in models to evaluate policy choices. We show, for this tax example, how debate on an elasticity parameter translates into debate about policy choices and vice-versa. To construct this example, we suppose that the choice among four particular tax reform options is based on a single measure of efficiency gain. We show how this gain from each reform depends upon the elasticity of saving with respect to the net rate of return. Within quite narrow and reasonable bounds for the elasticity parameter, we find regions in which each of three different tax reforms turns out to dominate the others.

Empirical Studies of Exchange Rates: Price Behavior, Rate Determination, and Market Efficiency

Richard M. Levich

Working Paper No. 1112

April 1983

JEL Nos. 430, 440

Theoretical and empirical research completed over the last decade has dramatically increased our understanding of exchange rate behavior. The major insight

to come from this decade of research is that foreign exchange is a financial asset. In an asset pricing framework, current exchange rates reflect the expected values of future exogenous variables.

The purpose of this paper is to survey the empirical evidence on exchange rate behavior, market efficiency, and related topics. Section 1 presents an introduction and the historical setting. Section 2 presents a stylized history of exchange rate behavior during the 1970s in which alternative measures of volatility and transaction costs are reviewed. Section 3 presents tests of specific exchange rate determination models. Empirical studies have been fairly successful in constructing models to explain cross-sectional exchange rate differences and in explaining time-series exchange rate developments over the medium run and long run. Following the asset market framework, recent studies have demonstrated that unanticipated exchange rate changes are significantly correlated with "news" concerning fundamental macroeconomic variables.

Section 4 summarizes evidence on foreign exchange market efficiency. Efficiency studies remain difficult to formulate (because of small samples and unobserved variables) and difficult to interpret (because of the joint hypothesis problem). Several recent studies claim that speculative profit opportunities are present, but it is unclear whether these are related to risk premiums or to actual market inefficiencies.

Are Asset Demand Functions Determined by CAPM?

Jeffrey A. Frankel and William T. Dickens

Working Paper No. 1113

May 1983

JEL No. 313

The Capital Asset Pricing Model (CAPM) says that the responsiveness of asset demands to expected returns depends (inversely) on the variance-covariance matrix of returns, rather than being an arbitrary set of parameters. Previous tests of CAPM have usually computed covariances of returns around sample means and then checked whether the riskier assets are those with the higher mean returns.

We offer a new technique for testing CAPM. The technique requires the use of time-series data on actual asset holdings, and nonlinear maximum likelihood estimation. We claim that this is superior to earlier tests on three grounds: (1) we allow expected returns to vary freely over time; (2) the alternative hypothesis is well specified—asset demands are linear functions of expected returns that do *not* depend on the variance-covariance matrix; (3) the test statistic has a known distribution—it is simply a likelihood ratio test. We try the technique on yearly data, 1954–80, for household holdings of a portfolio of six assets: short-term bills and deposits, federal debt, state and local debt, corporate debt, and equities. Our test rejects the CAPM hypothesis.

Monetary Instruments and Policy Rules in a Rational Expectations Environment

Michael Dotsey and Robert G. King

Working Paper No. 1114

May 1983

JEL No. 311

This paper explores the implications of rational expectations and the aggregate supply theory advanced by Lucas (1973) for analysis of optimal monetary policy under uncertainty along the lines of Poole (1970), returning to a topic initially treated by Sargent and Wallace (1975). Not surprisingly, these two "classical" concepts alter both the menu of feasible policy choice and the desirability of certain policy actions. In our setup, unlike that of Sargent and Wallace, the systematic component of monetary policy is a relevant determinant of the magnitude of "business fluctuations" that arise from shocks to the system. Central bank behavior—both the selection of monetary instruments and the framing of overall policy response to economic conditions—can work to diminish or increase the magnitude of business fluctuations. However, the "activist" policies stressed by the present discussion bear little (if any) relationship to the policy options rationalized by the conventional analysis of monetary policy under uncertainty. In particular, in contrast to Poole's analysis, money supply responses to the nominal interest rate are not important determinants of real economic activity. Rather, the central bank should focus on policies that make movements in the general price level readily identifiable by economic agents.

The Theorems of International Trade with Factor Mobility

Wilfred J. Ethier and Lars E. O. Svensson

Working Paper No. 1115

May 1983

JEL Nos. 411, 441

This paper addresses in general terms the relation between goods trade and international factor mobility. We derive conditions for factor price equalization for situations with trade in both goods and factors, as well as Rybczynski and Stolper-Samuelson theorems. We present a weak price version of the Heckscher-Ohlin theorem and stronger quantity versions thereof.

We show that the basic theorems of international trade, suitably interpreted, hold in their strong versions if the number of international markets is at least as large as the number of factors. The crucial dimensionality issue is hence not the relative number of goods and factors per se, but the number of international markets relative to the number of factors. Only the price version of the Heckscher-Ohlin theorem fails to be essentially preserved by this condition.

The Impact of Right-to-Work Laws on Union Organizing

David T. Ellwood and Glenn A. Fine

Working Paper No. 1116

May 1983

JEL No. 830

In contrast to previous studies that have examined the impact of Right-to-Work (RTW) laws on the level or stock of union membership, this paper examines their impact on the most updated flow into membership and the organizing of workers of workers through certified elections. Since detailed annual data are available by state, we are able to estimate an accelerator model of the flow into unionism and adjust for possible omitted variable and simultaneity bias. The results show dramatic falls in organizing immediately after the passage of a RTW law, with more moderate declines in later years, just as an accelerator model could predict. Overall, the results are consistent with a 5-10 percent reduction in unionism as a result of the passage of RTW laws.

Stabilization Policies in Open Economies

Richard C. Marston

Working Paper No. 1117

May 1983

JEL No. 430

This study analyzes the theory of stabilization policy as it has developed from the trade-oriented models of the 1950s to the recent models employing rational expectations. Throughout the study, I present one model appropriately modified to take into account international capital mobility, wage flexibility, and rational expectations: the Mundell-Fleming model with an asset sector based on modern portfolio theory. I analyze this same model under conditions of full wage and price flexibility and discuss the propositions associated with the monetary approach to the balance of payments and the exchange rate. I then use a simplified version of the model to examine the policy ineffectiveness propositions of the new classical economics (as applied to open economies). The study concludes with a brief review of the literature on the choice between exchange rate regimes.

International Liquidity and Monetary Control

Jacob A. Frenkel

Working Paper No. 1118

May 1983

JEL Nos. 430, 130

This paper deals with the relations among international liquidity, the exchange rate regime, and the ef-

fectiveness of monetary policy. The first part of the paper includes an empirical study of the demand for international reserves. It shows that: (1) reserve holdings are a stable function of a limited number of economic variables; and (2) the move to greater flexibility of exchange rates has not changed drastically the patterns of reserves holdings. The empirical work deals with developed and developing countries and it allows for country-specific and time-specific factors as well as for dynamic adjustments. The second part of the paper deals with the more general issue of the constraints that the openness of the economy imposes on the effectiveness and proper conduct of monetary policy, as well as the dependence of these constraints on the exchange rate regime. In this context the roles of the various exchange-market interventions are discussed. The analysis then explores alternative guidelines for monetary policy and argues that the conduct of policy can be improved by paying attention to the relation between exchange rates and interest rates. This relation is then used to interpret the recent evolution of interest rates. The paper concludes with a brief discussion of the role of the International Monetary Fund in the provision of liquidity.

Supply Shocks, Wage Stickiness, and Accommodation

Stanley Fischer

Working Paper No. 1119

May 1983

JEL No. 310

In the supply shock literature that followed the oil and food price shocks of the 1970s, the main issue discussed was whether to accommodate. A supply shock reduces the equilibrium level of output, and monetary policy cannot affect that. But in the 1970s supply shocks were also followed by recessions. The question is whether monetary policy can and should be used to prevent such recessions. This paper analyzes the conditions under which a supply shock will result in recession and the potential for monetary policy to offset the fall in output. The basic result is that a pure supply shock need not result in a recession if the money stock is held constant. Aggregate demand effects associated with the supply shock—including the effects of attempts to adjust monetary policy to fight the inflation caused by the supply shock—may cause a recession, as may real wage resistance by workers. The choice of policy response to the supply shock then turns on the same basic issues as countercyclical policy in general, particularly the relative costs of inflation and unemployment.

International Balance of Payments Financing and Adjustment

Willem H. Buiter and Jonathan Eaton

Working Paper No. 1120

May 1983

This paper explores some implications of the use of national currencies as international reserves. First, we develop a closed-economy, overlapping-generations model to derive time-consistent tax and inflation policies for a government that is financing a given stream of expenditures. Second, we consider the effects of allowing a government to hold a foreign currency as a reserve asset and to have its currency held as a reserve asset abroad. The use of national currencies as currencies of denomination for international lending creates an incentive for the governments whose currencies are used to alter their inflation rates to extract resources from the rest of the world. When reserves are constrained to be nonnegative, the use of national currencies as international reserves raises the inflation rate in reserve-issuing countries but does not affect the inflation rate in reserve holders. The opposite result arises when loans are denominated in the borrowers' currencies.

Commodity Prices, Overshooting, Money Surprises, and Fed Credibility

Jeffrey A. Frankel and Gikas Hardouvelis

Working Paper No. 1121

May 1983

JEL No. 313

Because most prices are sticky, the general price level is not a sensitive indicator of whether monetary policy is tight or loose. Interest rates are free to move, but they are an ambiguous indicator of monetary policy because one does not know whether changes in the interest rate are caused by changes in the expected rate of inflation or the real interest rate. Commodity prices, on the other hand, provide the ideal, sensitive indicator.

This paper has two distinct aims. First, it presents a theoretical model of "overshooting" in commodity markets. Known changes in the money supply are shown to cause instantaneous changes in commodity prices greater than the proportionate changes that describe long-run equilibrium. Second, the paper uses the Fed's Friday money supply announcements to test the theory. We find that an unexpectedly large money announcement causes significant negative reactions in the prices of six commodities. This supports at once the sticky-price or overshooting view and the notion that the market has confidence in the Fed's commitment to correcting any deviations from its money growth targets.

The Present Value of Profits and Cyclical Movements in Investment

Andrew B. Abel and Olivier J. Blanchard

Working Paper No. 1122

May 1983

JEL No. 130

Most of the empirical work on investment is based on the existence of a relation between investment and the expected present value of marginal profits. Thus, in this paper we compute such a present-value series, under various assumptions about demand and technology, and examine its relation to investment.

We find that variations in this present-value series are, surprisingly, more the result of variations in the cost of capital than of variations in marginal profit. We also find that the present-value series, although significantly related to investment, still leaves unexplained a large, serially correlated fraction of investment.

Which Effective Tax Rate?

Don Fullerton

Working Paper No. 1123

May 1983

JEL No. 320

In estimating the effects of capital income taxation, different studies measure different effective tax rates. This paper categorizes estimates of effective tax rates into six basic types and discusses the usefulness of each. For marginal effective tax rates, some studies estimate the additional taxes associated with a marginal increase in the inflation and interest rates, while others estimate the additional taxes associated with a marginal increase in investment. Because there are six basic types of rates, different procedures that can be used to estimate each type, and different assumptions are made about the margin, one should be careful in the application and use of estimates of effective tax rates.

Services in the Domestic Economy and in World Transactions

Irving B. Kravis

Working Paper No. 1124

May 1983

JEL Nos. 220, 420

A new interest in the role of services in world transactions has been generated by the current efforts of the

U.S. government to reduce barriers to international trade in services. This paper distinguishes four different classifications of economic activities between services and commodities. Service industries—those producing nonstorable outputs—have been growing in most domestic economies relative to commodity-producing industries, although about half the growth in their share in gross domestic product (GDP) is attributable to relative price increases.

The U.S. policy effort focuses on a somewhat different set of services that are referred to as “private non-factor services.” Exports of such services have not expanded relative to commodity exports. However, their sales by U.S. affiliates abroad are much larger than exports from the United States and have been growing more rapidly than affiliates’ commodity sales. It will not be easy to obtain the consent of foreign countries to a general easing of restrictions on direct foreign investment in service sectors. It may also be asked why, if growth is to be the criterion of special negotiating effort, the commodity-service dichotomy is relevant. Why not search for fast-growing sectors among commodities as well?

However, a successful effort to reduce some foreign barriers and the compensatory reductions in U.S. barriers that this would entail might provide a modest counterweight on the side of liberalization in a world in which restrictions are growing.

Defining a Unitary Business: An Economist's View

Charles E. McLure, Jr.

Working Paper No. 1125

May 1983

JEL No. 320

The definition of a unitary business has figured prominently in several recent decisions of the U.S. Supreme Court on the constitutionality of state corporate income taxes. This paper uses economic analysis to frame a three-part test of whether a unitary business exists. Underlying the test is the notion that a unitary business exists when separate accounting cannot satisfactorily isolate the profits of individual firms. The first test is common control. The second is whether transfer prices on transactions within the group could be manipulated; are difficult to verify; or whether substantial vertical integration, shared costs, economies of scale or scope, or other forms of economic interdependence make isolation of profits of affiliated firms impossible. The third test is one of substantiality.

Incentive Effects of Pensions

Edward P. Lazear

Working Paper No. 1126

May 1983

Many different types of pension plans exist in American firms. The stipulations of plans vary dramatically, even among large firms, with respect to vesting, relationship of the pension to final salary, maximum and minimum years of service constraints, and maximum and minimum benefit levels. I examine these provisions to determine their effects on worker behavior, specifically analyzing which plans encourage or discourage appropriate worker response in hours worked, turnover, human capital investment, and effort. Finally, I attempt to explain the provisions in light of the findings.

Monetary Policy in the Large Open Economy

Michael R. Darby

Working Paper No. 1127

May 1983

This paper discusses recent evidence on the imperfect international substitutability of goods and assets and the implications for conduct of monetary policy in a major industrial country. I develop a simple model to analyze the simultaneous determination of money growth and the balance of payments under pegged exchange rates. I draw parallels to the importance of expected depreciation in determination of floating exchange rates and assess the extent to which a central bank can simultaneously pursue both exchange rate and money supply goals through sterilized intervention. The paper concludes with the role of differences in saving rates in determining nonzero equilibrium trade balances.

The Economics of Retirement Behavior

Olivia S. Mitchell and Gary S. Fields

Working Paper No. 1128

May 1983

JEL Nos. 820, 918

This paper examines the role of economic factors in determining retirement behavior using a unique new data archive on more than 8700 workers covered by ten different pension plans. We build on our earlier work by estimating several different retirement models including linear as well as discrete choice formulations. This framework provides new insights into how and why

retirement ages differ across firms. We conclude that older workers' income opportunities differ depending on their pension rules, which in turn have a powerful influence on their retirement patterns. In addition, the models indicate that older workers' tastes for income are not uniform, either across individuals or across firms. Finally, we show that retirement age differences are in part the result of differences in worker preferences and in part the result of differences in income opportunities. There appears to be some evidence of the sorting of workers across pension plans.

Current Account Dynamics and the Terms of Trade: Harberger-Laursen-Metzler Two Generations Later

Torsten Persson and Lars E. O. Svensson

Working Paper No. 1129

May 1983

JEL Nos. 431, 441

This paper examines the current account dynamics for a small open economy subject to exogenous changes in its static terms of trade and in world interest rates. We use the model with overlapping, finite-lived generations, which we argue gives rise to a more reasonable saving behavior than models with infinite-lived consumers. In particular, no restrictions on the rate of time preference are required.

Anticipated and unanticipated, as well as temporary and permanent, changes in the terms of trade have very different effects. There is, however, a general tendency toward cycles in both savings and investment, which give rise to cycles in the current account.

The classic Harberger-Laursen-Metzler effect on saving of a deterioration in the terms of trade can have any sign for plausible parameter values, both for temporary and permanent disturbances.

The Substitutability of Debt and Equity Securities

Benjamin M. Friedman

Working Paper No. 1130

May 1983

JEL No. 311

This paper investigates empirically the degree of substitutability between debt and equity securities in the United States during 1960-80. The analysis first applies fundamental relationships connecting portfolio choices with expected asset returns to infer key as-

set substitutabilities directly from the observed U.S. asset return experience. It then compares these implied substitutabilities with the observed portfolio behavior of U.S. households.

The resulting evidence provides little ground for any conclusion about even the sign, much less the magnitude, of the substitutability of *short-term* debt and equity. Although the implied optimal behavior indicates that these two assets are substitutes, the observed behavior indicates that households have treated them as complements. By contrast, the evidence consistently indicates that *long-term* debt and equity are substitutes. Moreover, with a few exceptions the empirical estimates of the associated substitution elasticity are quite closely clustered around the value $-.035$.

The conclusion that long-term debt and equity are substitutes with elasticity $-.035$ bears mixed implications for broader economic and financial questions. At one level, the finding that the two assets are indeed substitutes validates the standard assumption underlying a variety of familiar models in monetary economics and finance. At the same time, if the elasticity is only $-.035$, then many of these models' more important substantive conclusions do not follow.

Interpreting Ex-Dividend Evidence: The Citizens Utilities Case Reconsidered

James M. Poterba

Working Paper No. 1131

May 1983

Numerous empirical studies have attempted to measure the effect of changes in dividend policy on corporate equity values. One of the most popular methodologies has been an examination of changes in share prices around ex-dividend days. Comparing the movement in a stock's price with its nominal dividend payment leads to estimates of the stock market's relative valuation of dividends and capital gains. Ex-day price studies are often interpreted as showing that investors recognize their tax liabilities and therefore discount their dividend income. These studies predict that firms that reduce their payout ratio should rise in value and buttress the view that an increase in dividend taxes would reduce the value of the stock market.

This paper disputes these conclusions by presenting a "counterexample" that suggests that ex-dividend day studies provide limited insight into the effects of dividend taxes, or dividend policy, on corporate valuation. I analyze a firm with two different classes of common stock: one class pays taxable cash dividends, while the other pays untaxed stock dividends. On ex-dividend days, the taxable dividend shares experience a price decline equal to about 75 percent of their dividend payment, while the untaxed stock distribution shares fall

by the full value of their dividends. However, the prices of the two classes of equity do not reflect this apparent market preference for nontaxable distributions. The average price of taxable dividend shares is approximately equal to that of the untaxed dividend shares, indicating that the market considers the two shares as equivalent.

These findings are important for several reasons. First, they cast doubt on earlier conclusions, based on ex-dividend day studies, about how a change in dividend taxes or payout policy would affect the market value of equity capital. Second, the results may provide new insights that help to explain why firms pay dividends. They deny the view that investors hold dividend paying stocks only because they are necessary for diversification and may suggest that there is some attribute of cash dividends that investors genuinely value.

The Effect of Risk on the Firm's Optimal Capital Stock: A Note

**Kevin J. Maloney, William J. Marshall,
and Jess B. Yawitz**

Working Paper No. 1132

May 1983

In this paper we extend the recent work on the choice of input mix under uncertainty. In particular, we demonstrate that the *qualitative* nature of the disturbance term, along with the decision sequence, is a crucial determinant of the overall effect of uncertainty on the optimal input mix of a firm. Using general demand and production functions in conjunction with a mean-variance framework for financial valuation, we demonstrate the differential effects of systematic and nonsystematic risk on the firm's choice of an optimal input mix. Consistent with earlier work in economics, this analysis demonstrates that uncertainty, regardless of the source, has important implications for the firm's choice of technology.

Seasonal Adjustment with Measurement Error Present

Jerry A. Hausman and Mark Watson

Working Paper No. 1133

May 1983

JEL Nos. 211, 824

Seasonal adjustment procedures attempt to estimate the sample realizations of an unobservable economic time series in the presence of both seasonal and irregular factors. In this paper we focus on a factor that

has not previously been considered explicitly in treatments of seasonal adjustment: measurement error. Because of the sample design used in the Current Population Survey (CPS), measurement error will not be a white noise process but instead will be characterized by serial correlation of a known form. We first consider what effect the serially correlated measurement error has on estimation of the nonseasonal component in seasonal adjustment models. We also consider the effect of measurement error on the widely used seasonal adjustment process, X11. The seasonal adjustment procedure used by the Bureau of Labor Statistics (BLS), X11, will implicitly reduce the effect of measurement error because of the averaging process used. However, this treatment in general will not be optimal. We therefore specify a seasonal adjustment model that takes explicit account of the measurement error. For examples on the unemployment rate, we find that X11 does almost as well as the optimal filter on some series, but its efficiency is less than 10 percent for the teenage unemployment series. We also find that optimal treatment of the measurement error that accounts for the serial correlation can reduce the overall mean square error of the seasonally adjusted series below the variance of the measurement error that is often used as the benchmark for the sampling procedure.

The Changing Relationship between Aggregate Price and Output: The British Experience

Richard T. Froyen and Roger N. Waud
Working Paper No. 1134
June 1983
JEL Nos. 023, 026

Over the past two-and-a-half decades, Great Britain has exhibited the most noticeable increase in inflation variability among the ten major noncommunist industrialized countries. In addition, there has been an apparent worsening in the output-inflation trade-off. This paper attempts to identify and empirically assess possible causes of the deterioration in the British output-inflation trade-off in the context of a new classical-type model. Supply-side shocks can cause an increase in the inflation rate and a decrease in real output, and we estimate that such shocks interacted with inflation variability to reduce real output roughly 3.3 percent between the period 1957-68 and the period 1969-80. Also contributing to the deterioration in the output-inflation trade-off, the decline in the natural rate of real output caused by inflation variability (as hypothesized by Milton Friedman) is estimated to have been about 2.3 to 2.5 between these two subperiods.

A Model of Exchange Rate Determination with Policy Reaction: Evidence from Monthly Data

William H. Branson
Working Paper No. 1135
June 1983

During the 1970s an extensive theoretical literature that analyzes market determination of freely floating exchange rates has developed. At the same time, there has been extensive and continuous intervention in the market by central banks. Exchange rates have not been floating freely; they have been managed, or manipulated, by central banks. However, most of the description of exchange rate policy, as actually practiced, has been informal, or "literary," not integrated with the formal theoretical literature. Recent examples are the surveys in Branson (1981a) and Mussa (1981).

In this paper I integrate exchange rate policy into a model of exchange rate behavior and examine the monthly data from the 1970s econometrically, to infer hypotheses about policy behavior. I focus on four major currencies—the U.S. dollar, the Deutschmark, sterling, and the Japanese yen—and analyze movements in their effective (weighted) exchange rates as calculated by the IMF.

In Section II a model of market determination of a floating exchange rate is laid out. It is a rational-expectations version of the model in Branson (1977), and it draws on the model of Kouri (1978). It is the same as the model in Branson (1983). The model shows how unanticipated movements in money, the current account, and relative price levels will cause a jump in the exchange rate first, and then a movement along a "saddle path" to the new long-run equilibrium. Here the role of "news" in moving the exchange rate, as recently emphasized by Dornbusch (1980) and Frenkel (1981), is clear. The model emphasizes imperfect substitutability between domestic and foreign bonds, in order to prepare the reader for the analysis of intervention policy in Section III.

Exchange rate policy is introduced in Section III. I analyze the options available to the central bank that wants to reduce the jump in the exchange rate following a real or monetary disturbance—"news" about the current account, relative prices, or money. This is the policy characterized as "leaning against the wind" in Branson (1976). I make the distinction between monetary policy and sterilized intervention.

In Section IV, I turn to the monthly data. The quarterly data were analyzed in Branson (1983). Systems of vector autoregressions (VARs) are estimated for each of the countries, and the correlations among their residuals are studied. These represent the "innovations," or "news" in the time series. A clear pattern emerges in these correlations, in which policy in the United States and Japan drives exchange rates, and policy in Germany and the United Kingdom reacts by moving interest rates, and by sterilized intervention. This is essen-

tially the same result that appeared on the quarterly data in Branson (1983). Thus the analyses tend to reinforce each other; both data sets tell basically the same story.

Right-to-Work Laws and the Extent of Unionization

Henry S. Farber

Working Paper No. 1136

June 1983

It is a well-known fact that the extent of unionization is lower in states with Right-to-Work (RTW) laws. This paper develops a framework for determining whether RTW laws actually cause a decrease in the extent of unionization or whether they simply mirror preexisting tastes of workers against unions. I propose a set of empirical tests that can distinguish between these explanations based on differences between RTW and non-RTW states in the demand for union representation, the supply of union jobs relative to that demand, and the observed union-nonunion wage differential. I use data from the Quality of Employment Survey and from the Current Population Survey to implement the tests.

The results indicate that the demand for union representation is significantly lower in states with RTW laws. At the same time, no significant difference is found on the basis of RTW laws in the supply of union jobs relative to demand. I also find that the observed union-nonunion wage differential is slightly larger in RTW states. This pattern is consistent with the hypothesis that RTW laws simply mirror preexisting preferences against union representation. In its entirety it is not consistent with the hypothesis that RTW laws cause a decrease in the extent of unionization.

A final interesting result is that the extent of unionization in the South is lower even after controlling for the presence of RTW laws in many of the states in that region. Further, it appears that this is the result of a supply of union jobs in the South that is more constrained relative to demand than elsewhere. This suggests that there exists a set of institutional or economic factors in the South that makes union organizing more difficult and expensive independent of the existence of RTW laws.

Capital Structure Change and Decreases in Stockholders' Wealth: A Cross-Sectional Study of Convertible Security Calls

Wayne H. Mikkelson

Working Paper No. 1137

June 1983

This paper is a cross-sectional analysis of the relationship between common stock price reactions to

announcements of convertible security calls and variables that represent possible determinants of changes in common stockholders' wealth. The variables are measures of the following effects of convertible security calls: (1) the change in interest expense tax shields; (2) the potential redistribution of wealth from common stockholders to preferred stockholders and debtholders; (3) the decrease in the value of conversion privileges held by holders of convertible securities; (4) the relative increase in shares outstanding; and (5) the change in earnings per share. A significant relationship is found only between the measure of the reduction in interest expense tax shields and the stock price response to call announcements. The apparent corporate tax effect is consistent with some combination of effects of: (1) a reduction in interest expense tax shields; and (2) unfavorable information about the calling firm's value or earnings prospects that is conveyed by a call of convertible securities. The evidence is consistent with theories of capital structure that imply that optimal financial leverage depends on earnings prospects and with theories that imply that reductions in leverage convey unfavorable information about firm value.

The Forward Exchange Market, Speculation, and Exchange Market Intervention

Jonathan Eaton and Stephen J. Turnovsky

Working Paper No. 1138

June 1983

JEL No. 431

This paper develops a stochastic equilibrium model of an open economy incorporating speculation in the forward exchange market. The model is used to examine two issues. The first is the role of speculation in stabilizing the economy against stochastic disturbances. Much risk-averse speculation stabilizes domestic income against disturbances in the domestic bond market and forward exchange market but exacerbates the effect of foreign disturbances. Speculation may dampen or augment the effect of money market and output supply disturbances depending upon the share of foreign bonds in total wealth and the interest elasticity of bond demand. The second issue that the model addresses is the role of the forward market in stabilization policy. Forward market intervention (or its equivalent in this model: *sterilized* spot market intervention) does not provide monetary authorities additional leverage in stabilizing income beyond unsterilized spot market intervention. Intervention rules based on reactions to both the forward and the spot exchange rates, however, can outperform intervention policies responding to the spot rate alone, regardless of the market in which intervention occurs.

Unionization and Productivity in Office Building and School Construction

Steven G. Allen

Working Paper No. 1139

June 1983

This paper examines the difference in productivity between union and nonunion contractors in the construction industry over a sample of 83 commercial office buildings and another sample of 68 elementary and secondary schools. The popular belief that the building trades unions reduce productivity in the industry is strongly rejected in both samples. Square footage per man-hour is 38 percent higher in office buildings built predominantly by union labor, controlling for differences in capital-labor ratios, observable labor quality, region, and building characteristics. Estimates of the union-nonunion productivity difference in the school sample range from zero (when output is measured in physical units) to 20 percent greater for union contractors (when output is measured as value added deflated by regional price differences), controlling for the same factors.

I also explore possible sources of higher union productivity in the office building sample. A lower rate of supervision to production worker hours and use of technologies and materials that economize on labor account for as much as 25 percent of the higher productivity observed in the union sample. The remainder is probably attributable to apprenticeship training, unobserved labor quality, economies of recruiting and screening, and improved management.

What Are the Determinants of Delayed Childbearing and Permanent Childlessness in the United States?

David E. Bloom and James Trussell

Working Paper No. 1140

June 1983

JEL No. 840

This paper presents estimates of delayed childbearing and permanent childlessness in the United States and the determinants of those phenomena. The estimates are derived by fitting the Coale-McNeil marriage model to survey data on age at first birth and by letting the parameters of the model depend on covariates. Substantively, the results provide evidence that the low first-birth fertility rates experienced in the 1970s were the result of both delayed childbearing and of increasing levels of permanent childlessness. The results also indicate that: (1) delayed childbearing is less prevalent among black women than among nonblack women; (2) education and labor force participation are important determinants of delayed childbearing; (3) the influence of education and labor force participation on delayed childbearing seems to be increasing across cohorts;

(4) education is positively associated with heterogeneity among women in their age at first birth; (5) the dispersion at age of first birth is increasing across cohorts; (6) race has an insignificant effect on childlessness; and (7) education is positively associated with childlessness, with the effect of education increasing and reaching strikingly high levels for the most recent cohorts.

Why Are Real Interest Rates So High?

Zvi Bodie, Alex Kane, and Robert McDonald

Working Paper No. 1141

June 1983

This paper applies the Capital Asset Pricing Model to the anomalous behavior of real interest rates during the last several years. Specifically, we are able to show that the increased volatility of bond prices since the change in Federal Reserve operating procedure in October 1979 has substantially increased the required real risk premium on long-term bonds. We also consider and reject the possibility that increased risk alone accounts for the recent increase in the short-term real rate. Finally, we use the model to simulate the financial effects of a federal debt maturity management operation.

Debt and Equity Yields: 1926-80

Patric H. Hendershott and Roger Huang

Working Paper No. 1142

June 1983

JEL No. 313

The study is divided into four broad parts, beginning with an exploratory analysis of the data on ex post returns on corporate equities and bonds for the 1926-80 period. In Part 2, we estimate the relationships between one-month ex post returns on corporate bonds and equities and variations in Treasury bill rates, economic activity, and other variables. (The major other variable is unanticipated changes in new issue coupon rates on long-term Treasury bonds.)

Parts 3 and 4 contain econometric investigations of the determinants of one-month Treasury bill rates and unanticipated changes in long-term Treasury coupon rates, respectively. These sections extend the analysis of Part 2 by explaining variables that both determine ex post corporate bond and equity returns and provide evidence on the determination of new-issue yields on short- and long-term default-free debt. The last three parts of the study report econometric results based on data from the 1953-83 period.

The econometric sections of the paper address a number of important issues. These include: the validity of the Modigliani-Cohn valuation-error hypothesis; the measurement of Merton's "excess return on the market"; the relationship between real new-issue debt rates and real economic activity; and the usefulness of the Livingston survey data in explaining financial returns.

Contingent Claims Valuation of Corporate Liabilities: Theory and Empirical Tests

E. Philip Jones, Scott P. Mason, and Eric Rosenfeld
Working Paper No. 1143
June 1983

Although the Contingent Claims Analysis model has become the premier theory of how value is allocated among claimants on firms, its empirical validity remained an open question. In addition to being of academic interest, a test of the model would have significant practical implications. If it can be established that the model predicts actual market prices, then the model can be used to price new and untraded claims, to infer firm values from prices of traded claims such as equity, and to price covenants separately. In this paper we present evidence on how well a model that makes the usual assumptions in the literature does in predicting market prices for claims in standard capital structures. The results suggest that the usual assumption list requires modification before it can serve as a basis for valuing corporate claims.

Shunto, Rational Expectations, and Output Growth in Japan

Herschel Grossman and William Haraf
Working Paper No. 1144
June 1983
JEL Nos. 023, 131

This paper describes a theoretical and empirical study of the Japanese macroeconomy that focuses on the role of predetermined nominal wages in the relation between monetary policy and aggregate output. The main features of the model are that nominal wage rates set at Shunto (the "spring labor offensive"—that point in the calendar year when all wage bargaining takes place) are equal to rational expectations of the nominal wage rates that would be consistent with target levels of real output, and that firms determine employment and output by equating marginal productivities to real wage rates. The essential implication of the model is that the current deviation of aggregate output from its target level depends only on innovations in inflation and productivity since the last Shunto. The equation derived to implement the model empirically relates current aggregate output growth in a precise way to past values of output growth and inflation since the last Shunto and includes an explicit specification of a white noise error term. The results of econometric analysis of this restricted model equation are consistent with the hypothesis that nominal wages predetermined according to Shunto with rational expectations are important for the determination of real aggregates. The empirical analy-

sis, however, also suggests that the assumptions about monetary policy used to close the model are not adequate, a result that leads to directions for further research.

Investment Patterns and Financial Leverage

Michael S. Long and Ileen B. Malitz
Working Paper No. 1145
June 1983

This study investigates the influence of the type of investment opportunities facing a firm on its choice of capital structure. We show that the more discretionary investment opportunities a firm faces, the lower its financial leverage. Inclusion of other possible determinants of capital structure, such as availability of internal funds, tax effects, and risk, while significant, do not affect the importance of discretionary investment. The evidence supports: (1) the existence of a moral hazard problem that inversely relates risky debt and discretionary investment choice; and (2) a desire by most firms to use sources of internal funds prior to entering the capital market.

Life Cycles in Income and Wealth

J. R. Kearl and Clayne L. Pope
Working Paper No. 1146
June 1983

Using panel data for a sample of households in Utah from 1850 to 1900, we find income and wealth age profiles that are concave and that have a peak within the age distribution of the relevant sample. This finding holds for cross-sections at five-year intervals, for pooled cross-section time-series data, for cohort data, for households when individual differences are accounted for with a variance-components model, and when we account for vintage measured as duration within the economy.

We also find a relationship between age-income and age-wealth profiles that is consistent with a life-cycle model of consumption given a concave and peaked age-income profile: households accumulate and then begin to draw down wealth holdings, the age-wealth profile consistently peaks at an age later than the age-income profile for the same households, and the age-wealth profile for young households is considerably steeper than is the age-income profile.

We have data, then, that in many respects appear to be capable of having been generated by individual decisions in a contemporary economy. This is particularly interesting since the data were, in fact, generated within a very different economy, one where formal education, on-the-job training and labor-leisure choices were probably considerably less important than in a contemporary economy.

Inflexible Relative Prices and Price Level Inertia

Olivier J. Blanchard

Working Paper No. 1147

June 1983

JEL No. 130

A decrease in aggregate demand at given prices and wages decreases output and employment. The decrease in employment exerts downward pressure on real wages. The decrease in production exerts downward pressure on markups. With perfectly synchronized price and wage decisions, nominal wages and prices decrease simultaneously until equilibrium is reestablished at a lower price level and the initial relative prices. If, however, price and wage decisions are asynchronized, this process cannot take place instantaneously but rather takes place over time. If real wages and markups are rather insensitive to shifts in demand, the process of adjustment is slow, the effects of money on output are strong and lasting.

This paper formalizes the intuitive argument and characterizes the implications of asynchronization for the joint behavior of relative and nominal prices.

Consumer Durables and the Real Interest Rate

N. Gregory Mankiw

Working Paper No. 1148

June 1983

One important channel through which real interest rates affect aggregate demand is consumer expenditures on durable goods. This paper empirically examines the link between interest rates and consumer durables. Solving for the decision rule relating income and interest rates to consumer demand is an intractable task. This paper avoids the problem by examining the first-order conditions necessary for maximization by the representative consumer. Structural parameters of the representative utility function are thus recovered. The estimated model suggests that expenditures on consumer durables are far more sensitive to changes in the interest rate than are expenditures on nondurables and services.

Models of Arbitrator Behavior: Theory and Evidence

Orley Ashenfelter and David E. Bloom

Working Paper No. 1149

June 1983

JEL No. 830

This paper analyzes and compares arbitrator behavior under conventional and final-offer arbitration. We develop simple models of arbitrator behavior under each of these alternative mechanisms. These models are estimated and tested using data on the outcomes of both forms of arbitration in New Jersey, where arbitration is mandatory for unresolved pay disputes involving police officer unions and public employers. The major findings are: (1) the high proportion of union victories under final-offer arbitration were generated by a set of impartial arbitrators applying the same standards used in conventional arbitration; and (2) union bargainers appear to be considerably more risk averse than employer bargainers, with the wage increases under final-offer arbitration having a lower mean and a lower variance than under conventional arbitration.

Wage Contracts with Incomplete and Costly Information

Joshua Aizenman

Working Paper No. 1150

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Optimal wage indexation, as derived by Gray, was criticized for: (1) a lack of efficient use of information; (2) failure to clear the market that resulted in nonoptimal contracts; and (3) the lack of an explicit use of welfare criteria. The purpose of this paper is to derive a wage contract scheme that is free from the above criticism but is capable of preserving the insight of Gray's analysis. In so doing, the analysis reveals the role of costs of information collection in a world characterized by incomplete information. The analysis also focuses on the interaction between wage indexation and costly information collection as alternative adjustment schemes. It shows that the first depends only on relative variances, whereas the second also depends on aggregate volatility. The justification for labor contracts hinges on the cost of information collection and on last-minute wage negotiation.

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