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Program Report

The Government Budget and the Private Economy

Geoffrey Carliner

During the past few years, the United States has been involved in a sharp debate over the appropriate size and composition of government budgets. Part of the disagreement results from differences in philosophy concerning the proper role of government in redistributing income. However, much of the debate centers on disagreements about how the economy works. Do high tax rates discourage work effort, saving, and investment? Do taxes decrease economic efficiency by distorting the choice between debt and equity financing, between investment in the United States or overseas, or between renting and owning? How do transfer programs affect saving and retirement decisions, labor supply and unemployment, housing choice, and health care? What are the effects of federal policies on taxation and spending by state and local governments? Do government deficits raise interest rates, crowd out private investment, or cause inflation?

To answer these and other questions, NBER is now conducting a major study of the impact of the government budget on the private economy. In the three years since it began, this project has produced a large number of working papers by researchers from every Bureau program. This report provides a brief summary of many of the topics covered by this project, grouped into five broad areas.

The Impact of Taxation

Bureau researchers have paid particular attention to the effects of taxation on various aspects of economic behavior. Several economists have examined the possible disincentives to saving that taxes may create. Louis Dicks-Mireaux, Mervyn A. King, Lawrence H.

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This issue of the *Reporter* highlights the Bureau's study of the impact of the government budget on the private economy. Next, Edward P. Lazear describes his work on pensions and economic incentives. Then, Jess B. Yawitz discusses the effect of default risk on bonds. 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.

Summers, Don Fullerton, Yolanda K. Henderson, Laurence J. Kotlikoff, Edward J. Kane, Patric H. Hendershott, and Marc Smith have all analyzed the effects of taxation on household saving.¹ Several of these authors,

¹M. A. King and L. Dicks-Mireaux, "Pension Wealth and Household Savings: Tests of Robustness," NBER Working Paper No. 962, August 1982; M. A. King, "The Economics of Saving," NBER Working Paper No. 1247, December 1983; L. H. Summers, "Tax Policy, the Rate of Return, and Savings," NBER Working Paper No. 995, September 1982, and "The Aftertax Rate of Return Affects Private Savings," NBER Reprint No. 513, August 1984; D. Fullerton and Y. K.

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as well as Alan J. Auerbach, have also investigated tax incentives and disincentives for business saving.²

Taxes affect not only the savings decisions of households and businesses; they also may affect investment decisions. Summers and James M. Poterba have studied the possible effects on investment of dividend taxation, while Auerbach has analyzed the effects of the corporate tax on investment.³ Andrew B. Abel and Olivier J. Blanchard have examined the potential impact of taxes on the cyclical pattern of investment,⁴ while Joel Slemrod has studied the effects of the tax system on the allocation of capital to different sectors of the economy.⁵ In addition, Slemrod, Hendershott, Harvey S. Rosen, Kenneth T. Rosen, and Douglas Holtz-Eakin have all considered the special tax treatment of the housing industry, the possible incentive that exists for investment in residential real estate, in general, and for homeownership in particular.⁶ Finally, David G. Hart-

Henderson, "Incentive Effects of Taxes on Income from Capital: Alternative Policies in the 1980s," NBER Working Paper No. 1262, January 1984; L. J. Kotlikoff, "Taxation and Savings—A Neoclassical Perspective," NBER Working Paper No. 1302, March 1984; E. J. Kane, "Microeconomic Evidence on the Composition of Effective Household Savings during the 1960s and 1970s," NBER Working Paper No. 1349, May 1984; P. H. Hendershott and J. Peek, "Household Saving: An Econometric Investigation," NBER Working Paper No. 1383, June 1984; and P. H. Hendershott and M. Smith, "Household Formations," NBER Working Paper No. 1390, June 1984.

²A. J. Auerbach, "Issues in the Measurement and Encouragement of Business Saving," NBER Reprint No. 367, May 1983; and L. J. Kotlikoff, "National Savings and Economic Policy: The Efficacy of Investment versus Savings Incentives," NBER Reprint No. 427, November 1983.

³J. M. Poterba and L. H. Summers, "New Evidence That Taxes Affect the Valuation of Dividends," NBER Working Paper No. 1288, March 1984, and "The Economic Effects of Dividend Taxation," NBER Working Paper No. 1353, May 1984; and A. J. Auerbach, "The Economic Effects of the Corporate Income Tax: Changing Revenues and Changing Views," NBER Working Paper No. 1519, December 1984.

⁴A. B. Abel and O. J. Blanchard, "The Present Value of Profits and Cyclical Movements in Investment," NBER Working Paper No. 1122, May 1983.

⁵J. Slemrod, "Tax Effects on the Allocation of Capital among Sectors and Individuals: A Portfolio Approach," NBER Working Paper No. 951, August 1982.

⁶P. H. Hendershott and J. Slemrod, "Taxes and the User Cost of Capital for Owner-Occupied Housing," NBER Reprint No. 406, September 1983; P. H. Hendershott, "Government Policy and the Allocation of Capital between Residential and Industrial Uses," NBER Reprint No. 425, November 1983; P. H. Hendershott and D. C. Ling, "Trading and the Tax Shelter Value of Depreciable Real Estate," NBER Reprint No. 530, October 1984, "Prospective Changes in Tax Law and the Value of Depreciable Real Estate," NBER Reprint No. 563, February 1985, and "Tax Reform and Housing," NBER Working Paper No. 1524, December 1984; and H. S. Rosen, K. T. Rosen, and D. Holtz-Eakin, "Housing Tenure, Uncertainty, and Taxation," NBER Reprint No. 549, November 1984.

man, Daniel J. Frisch, Lawrence H. Goulder, John B. Shoven, and John Whalley have studied the incentive effects of taxation on foreign investment.⁷

When firms decide on particular investments, they often must also choose how to finance the investment. Tax considerations may also affect the choice between debt and equity. Robert L. McDonald, Auerbach, Alex Kane, Alan J. Marcus, Stewart C. Myers, and Nicholas J. Majluf have examined the effects of various tax provisions on corporate finance.⁸ Fumio Hayashi has studied the tax considerations involved in a firm's decision to declare bankruptcy.⁹

Bureau researchers have also examined the effects of taxes on the value of stocks and bonds. In addition to papers by Auerbach, Poterba, and Summers already cited, Working Papers by Poterba, George M. Constantinides, Jonathan E. Ingersoll, Jr., Wayne H. Mikkelson, Jess B. Yawitz, Kevin J. Maloney, and Louis H. Ederington have been written on this subject.¹⁰

Taxes may also affect the amount of labor supplied by an individual and one's job choice. Jerry A. Hausman, Paul Ruud, and Daniel S. Hamermesh have all written about the effects of taxes on labor supply, while James N. Brown and Harvey Rosen have investigated

the effect of taxes on job choice.¹¹ Finally, Charles T. Clotfelter (in a forthcoming book) and Daniel Feenberg have both analyzed the effect of various taxes on charitable contributions.¹²

Government Spending

The government budget can affect individual behavior through a variety of transfer programs as well as through the tax code. For instance, Social Security benefits may influence the age of retirement, the level of savings prior to retirement, income and consumption levels during retirement, and possibly bequests at death. Gary S. Fields, Olivia S. Mitchell, Hamermesh, Roger Hall Gordon, Alan L. Gustman, Thomas L. Steinmeier, and Frederic P. Slade have studied the effect of Social Security on retirement decisions.¹³ Hamermesh, Martin Feldstein, R. Glenn Hubbard, and B. Douglas Bernheim have examined the impact of Social Security on saving and consumption by the elderly.¹⁴ Michael D.

⁷D. G. Hartman, "Tax Policy and Foreign Direct Investment in the United States," NBER Working Paper No. 967, August 1982; D. G. Hartman and D. J. Frisch, "Taxation and the Location of U.S. Investment Abroad," NBER Working Paper No. 1241, November 1983; and L. H. Goulder, J. B. Shoven, and J. Whalley, "Domestic Tax Policy and the Foreign Sector: The Importance of Alternative Foreign Sector Formulations to Results from a General Equilibrium Tax Analysis Model," NBER Working Paper No. 919, June 1982.

⁸R. L. McDonald, "Government Debt and Private Leverage: An Extension of the Miller Theorem," NBER Reprint No. 470, March 1984; A. J. Auerbach, "Taxation, Corporate Financial Policy, and the Cost of Capital," NBER Reprint No. 442, January 1984, and "Real Determinants of Corporate Leverage," NBER Working Paper No. 1151, June 1983; A. Kane, A. J. Marcus, and R. L. McDonald, "How Big Is the Tax Advantage to Debt?" NBER Working Paper No. 1286, March 1984, and "Debt Policy and the Rate of Return Premium to Leverage," NBER Working Paper No. 1439, August 1984; S. C. Myers, "Capital Structure Puzzle," NBER Working Paper No. 1393, July 1984; and S. C. Myers and N. S. Majluf, "Corporate Finance and Investment Decisions When Firms Have Information That Investors Do Not Have," NBER Working Paper No. 1396, July 1984.

⁹F. Hayashi, "Real and Financial Decisions of a Firm with Bankruptcy and Default: An Integration," NBER Working Paper No. 1097, March 1983.

¹⁰J. M. Poterba, "Interpreting Ex-Dividend Evidence: The Citizens Utilities Case Reconsidered," NBER Working Paper No. 1131, May 1983, and "Expected Future Tax Policy and Tax-Exempt Bond Yields," NBER Working Paper No. 1469, September 1984; G. M. Constantinides, "Optimal Stock Trading with Personal Taxes: Implications for Prices and the Abnormal January Returns," NBER Reprint No. 507, August 1984; G. M. Constantinides and J. E. Ingersoll, Jr., "Optimal Bond Trading with Personal Taxes," NBER Reprint No. 557, December 1984; W. H. Mikkelson, "Capital Structure Change and Decreases in Stockholders' Wealth: A Cross-Sectional Study of Convertible Security Calls," NBER Working Paper No. 1137, June 1983; and J. B. Yawitz, K. J. Maloney, and L. H. Ederington, "Taxes, Default Risk, and Yield Spreads," NBER Working Paper No. 1215, October 1983.

¹¹J. A. Hausman, "Taxes and Labor Supply," NBER Working Paper No. 1102, March 1983; J. A. Hausman and P. Ruud, "Family Labor Supply with Taxes," NBER Working Paper No. 1271, February 1984; D. S. Hamermesh, "Incentives for the Homogenization of Time Use," NBER Working Paper No. 1397, July 1984; and J. N. Brown and H. S. Rosen, "Taxation, Wage Variation, and Job Choice," NBER Working Paper No. 1284, March 1984.

¹²C. T. Clotfelter, *Federal Tax Policy and Charitable Giving*, Chicago: University of Chicago Press, forthcoming June 1985; and D. Feenberg, "Identification in Tax-Price Regression Models: The Case of Charitable Giving," NBER Working Paper No. 988, September 1982.

¹³G. S. Fields and O. S. Mitchell, "Economic Determinants of the Optimal Retirement Age: An Empirical Investigation," NBER Working Paper No. 876, April 1982, "Rewards to Continued Work: The Economic Incentives for Postponing Retirement," NBER Working Paper No. 1204, September 1983, and "The Effects of Social Security Reforms on Retirement Ages and Retirement Incomes," NBER Working Paper No. 1348, May 1984; D. S. Hamermesh, "Life-Cycle Effects on Consumption and Retirement," NBER Reprint No. 523, September 1984; R. H. Gordon, "Social Security and Labor Supply Incentives," NBER Working Paper No. 986, September 1982; A. L. Gustman and T. L. Steinmeier, "Partial Retirement and Wage Profiles of Older Workers," NBER Working Paper No. 1000, October 1982, and "Social Security Reform and Labor Supply," NBER Working Paper No. 1212, October 1983; and F. P. Slade, "Labor Force Entry and Exit of Older Men: A Longitudinal Study," NBER Working Paper No. 1029, November 1982.

¹⁴D. S. Hamermesh, "Consumption during Retirement: The Missing Link in the Life Cycle," NBER Reprint No. 517, September 1984; M. Feldstein, "The Optimal Level of Social Security Benefits," NBER Working Paper No. 970, August 1982; R. G. Hubbard, "Social Security and Household Portfolio Allocation," NBER Working Paper No. 1361, June 1984, and "Precautionary Saving Revisited: Social Security, Individual Welfare, and the Capital Stock," NBER Working Paper No. 1430, August 1984; Tadashi and Tetsuji Yamada, "Estimation of a Simultaneous Model of Married Women's Labor Force Participation and Fertility in Urban Japan," NBER Working Paper No. 1362, June 1984; and B. D. Bernheim, "Dissaving after Retirement: Testing the Pure Life-Cycle Hypothesis," NBER Working Paper No. 1409, July 1984.

Hurd, Shoven, James E. Pesando, and Michael J. Boskin have analyzed the effects of Social Security on the income and economic status of the elderly.¹⁵ And, Abel has studied the effect of Social Security on bequests.¹⁶

NBER researchers have also examined the impacts of other transfer programs. Slade has studied the effect of disability insurance on labor supply.¹⁷ Gary Solon, Kim B. Clark, Summers, Feldstein, and Poterba have analyzed the effects of unemployment insurance on the duration of spells of unemployment and on the measured unemployment rate.¹⁸ Harvey Rosen, Steven F. Venti, and David A. Wise have looked at the impact of housing subsidies on individual housing decisions.¹⁹ Fred Goldman, Michael Grossman, Victor R. Fuchs, Hope Corman, Paul J. Taubman, and Robin C. Sickles have studied the effect of government programs on the health of the poor and the elderly.²⁰ Hamermesh and James M. Johannes have examined the

food stamp program.²¹ And Ronald G. Ehrenberg and Rebecca A. Luzadis have analyzed the effects on college attendance of cutbacks in government scholarship programs.²²

Public Sector Payrolls

A substantial share of government budgets goes to pay government employees. Several Bureau researchers have completed studies of public sector payrolls, and several other studies are now underway. Herman B. Leonard has examined retirement programs for federal civil servants.²³ Charles C. Brown has analyzed geographic variation in military enlistments.²⁴ Richard B. Freeman, Casey Ichniowski, and Harrison Lauer have written on public sector unions, particularly police unions.²⁵ Jeffrey S. Zax has studied the wages of municipal workers, and Charles F. Manski has studied the earnings of teachers.²⁶

State and Local Government Budgets

Although most of the research in this project has focused on federal budgets, state and local tax and spending programs have also received some attention. Charles E. McLure, Jr., Roger Gordon, and John D. Wilson have analyzed unitary taxation under state corporate income taxes; Slemrod and Nikki Sorum have estimated the costs to taxpayers of filing state and federal personal income tax returns; and Peter M. Mieszkowski and George R. Zodrow have studied the incidences of the property tax.²⁷ Also, Gordon and Slemrod

¹⁵M. D. Hurd and J. B. Shoven, "The Economic Status of the Elderly," NBER Working Paper No. 914, June 1982, and "The Distributional Impact of Social Security," NBER Working Paper No. 1155, June 1983; J. E. Pesando, "Valuing Pensions (Annuities) with Different Types of Inflation Protection in Total Compensation Comparisons," NBER Working Paper No. 956, August 1982; and M. J. Boskin and J. B. Shoven, "Concepts and Measures of Earnings Replacement during Retirement," NBER Working Paper No. 1360, June 1984.

¹⁶A. B. Abel, "Bequests and Social Security with Uncertain Lifetimes," NBER Working Paper No. 1372, June 1984.

¹⁷F. P. Slade, "Labor Supply under Disability Insurance," NBER Working Paper No. 860, February 1982.

¹⁸G. Solon, "Work Incentive Effects of Taxing Unemployment Benefits," NBER Working Paper No. 1260, January 1984; K. B. Clark and L. H. Summers, "Unemployment Insurance and Labor Market Transitions," NBER Reprint No. 520, September 1984; and M. Feldstein and J. M. Poterba, "Unemployment Insurance and Reservation Wages," NBER Reprint No. 544, November 1984.

¹⁹H. S. Rosen, "Housing Subsidies: Effects on Housing Decisions, Efficiency, and Equity," NBER Working Paper No. 1161, June 1983; and S. F. Venti and D. A. Wise, "Moving and Housing Expenditure: Transaction Costs and Disequilibrium," NBER Reprint No. 562, February 1985.

²⁰F. Goldman and M. Grossman, "The Production and Cost of Ambulatory Medical Care in Community Health Centers," NBER Working Paper No. 907, June 1982, and "The Impact of Public Health Policy: The Case of Community Health Centers," NBER Working Paper No. 1020, November 1982; V. R. Fuchs, "Though Much Is Taken—Reflections on Aging, Health, and Medical Care," NBER Working Paper No. 1269, January 1984; H. Corman and M. Grossman, "Determinants of Neonatal Mortality Rates in the United States: A Reduced-Form Model," NBER Working Paper No. 1387, June 1984; and P. J. Taubman and R. C. Sickles, "Supplementary Social Insurance and the Health of the Poor," NBER Working Paper No. 1062, January 1983, and "An Analysis of the Health and Retirement Status of the Elderly," NBER Working Paper No. 1459, September 1984.

²¹D. S. Hamermesh and J. M. Johannes, "Food Stamps as Money and Income," NBER Working Paper No. 1231, November 1983.

²²R. G. Ehrenberg and R. A. Luzadis, "The Social Security Student Benefit Program and Family Decisions," NBER Working Paper No. 1357, May 1984.

²³H. B. Leonard, "The Federal Civil Service Retirement System: An Analysis of Its Financial Condition and Current Reform Proposals," NBER Working Paper No. 1258, January 1984.

²⁴C. C. Brown, "Military Enlistments: What Can We Learn from Geographic Variation?" NBER Working Paper No. 1261, January 1984.

²⁵R. B. Freeman, "Unionism Comes to the Public Sector," NBER Working Paper No. 1452, September 1984; and R. B. Freeman, C. Ichniowski, and H. Lauer, "Collective Bargaining Laws and Threat Effects of Unionism in the Determination of Police Compensation," NBER Working Paper No. 1578, March 1985.

²⁶J. S. Zax, "Labor Relations, Wages, and Nonwage Compensation in Municipal Employment," NBER Working Paper No. 1582, March 1985; and C. F. Manski, "Academic Ability, Earnings, and the Decision to Become a Teacher: Evidence from the National Longitudinal Study of the High School Class of 1972," NBER Working Paper No. 1539, January 1985.

²⁷C. E. McLure, Jr., "Defining a Unitary Business: An Economist's View," NBER Reprint No. 472, April 1984; R. H. Gordon and J. D. Wilson, "An Examination of Multijurisdictional Corporate Income Taxes under Formula Reapportionment," NBER Working Paper No. 1369, June 1984; J. Slemrod and N. Sorum, "The Compliance Cost of the U.S. Individual Income Tax System," NBER Working Paper No. 1401, July 1984; P. M. Mieszkowski and G. R. Zodrow, "The New View of the

have analyzed the effects of federal subsidies on state and local spending.²⁸

Government Deficits

Federal government budget deficits during the past four years have constituted a share of GNP that is unprecedented for the United States except during years of war. What effect have these deficits—and the expectation of large future deficits—had on the economy? Benjamin M. Friedman, Bennett T. McCallum, Willem H. Buiter, V. Vance Roley, Olivier J. Blanchard, Ray C. Fair, and Robert J. Barro have asked in their work whether large deficits raise real interest rates and tend to crowd out private investment.²⁹ Buiter, Jacob A. Frenkel, and Assaf Razin have also analyzed the effect of budget deficits on international capital flows and exchange rates.³⁰ Finally, Feldstein, Joseph E. Stiglitz, Barro, Daniel Valente Dantas, and Rudiger Dornbusch have written on a number of aspects of budget deficits.³¹

Property Tax: A Reformulation, NBER Working Paper No. 1481, October 1984; and P. M. Mieszkowski, "The Incidence of the Local Property Tax: A Reevaluation," NBER Working Paper No. 1485, October 1984.

²⁸R. H. Gordon, "An Optimal Taxation Approach to Fiscal Federalism," NBER Working Paper No. 1004, October 1982; and R. H. Gordon and J. Slemrod, "A General Equilibrium Simulation Study of Subsidies to Municipal Expenditures," NBER Working Paper No. 1080, February 1983.

²⁹B. M. Friedman, "Interest Rate Implications for Fiscal and Monetary Policies: A Postscript on the Government Budget Constraint," NBER Reprint No. 328, November 1982, "Managing the U.S. Government Deficit in the 1980s," NBER Working Paper No. 1209, October 1983, and "Implications of Government Deficits for Interest Rates, Equity Returns, and Corporate Financing," NBER Working Paper No. 1520, December 1984; B. T. McCallum, "Are Bond-Financed Deficits Inflationary? A Ricardian Analysis," NBER Reprint No. 474, April 1984; W. H. Buiter, "Deficits, Crowding Out, and Inflation: The Simple Analytics," NBER Working Paper No. 1078, February 1983, and "Measuring Aspects of Fiscal and Financial Policy," NBER Working Paper No. 1332, April 1984; V. V. Roley, "Asset Substitutability and the Impact of Federal Deficits," NBER Working Paper No. 1082, February 1983; R. C. Fair, "Effects of Expected Future Government Deficits on Current Economic Activity," NBER Working Paper No. 1293, March 1984; and R. J. Barro, "The Behavior of U.S. Deficits," NBER Working Paper No. 1309, March 1984.

³⁰W. H. Buiter, "Fiscal Policy in Open, Interdependent Economies," NBER Working Paper No. 1429, August 1984; and J. A. Frenkel and A. Razin, "Budget Deficits and Rates of Interest in the World Economy," NBER Working Paper No. 1354, May 1984, and "The International Transmission of Fiscal Expenditures and Budget Deficits in the World Economy," NBER Working Paper No. 1527, December 1984.

³¹M. Feldstein, "Debt and Taxes in the Theory of Public Finance," NBER Working Paper No. 1433, August 1984, and "Can an Increased Budget Deficit Be Contractionary?" NBER Working Paper No. 1434, August 1984; J. E. Stiglitz, "On the Relevance or Irrelevance of Public Financial Policy," NBER Working Paper No. 1057, January 1983; R. J. Barro, "The Behavior of U.S. Deficits," NBER Working Paper No. 1309, March 1984; and D. V. Dantas and R. Dornbusch, "Anticipated Budget Deficits and the Term Structure of Interest Rates," NBER Working Paper No. 1518, December 1984.

Research Summaries

Pensions and Economic Incentives

Edward P. Lazear

Pensions have come to play an increasingly important role in American labor markets. The number of workers who are enrolled in pension plans has grown steadily since the 1950s and the share of pensions in total compensation has increased as well. Until recently, though, academics have neglected the workings of pension plans. Consequently, NBER's Project on Pensions has brought together labor and finance economists over the past few years. Primarily within that project, I have written a number of papers that deal with pensions and their effects on labor market behavior that I will summarize here.

Pensions as an Incentive Device

The underlying theme in my work is that pensions are more than merely assets that yield the before-tax rate of interest. They are an integral part of the compensation package and they affect worker behavior, even if their effects are inadvertent. Many of the provisions of major pension plans serve useful roles and provide workers with appropriate incentives. Even if this is not always true, it is important to understand what the effects of these plans actually are.

Much of what is found in my analyses of pensions can be traced back to my work on mandatory retirement ("Why Is There Mandatory Retirement?" *Journal of Public Economics*, 1979). That paper argued that mandatory retirement was not a capricious institution designed to exploit workers but rather was the by-product of a compensation scheme designed to provide workers with effort incentives. Pensions fit naturally into this context. First, they place a pot of gold at the end of the rainbow. This affects workers' desire to remain with the firm. Second, by varying the amount of pension associated with each age of retirement, a worker can be encouraged implicitly to retire early or to delay retirement. (Sometimes, such encouragement is explicit. Buy-out programs are frequently offered to workers in firms that face declining demand. The buy-out usually takes the form of a sweetened pension payment.) This second aspect of pensions is the subject of two NBER papers ("Severance Pay, Pensions, and Efficient Mobility," NBER Working Paper No. 854, February 1982, and "Pensions as Severance Pay," in Z. Bodie and J. B. Shoven, eds., *Financial Aspects of the U.S. Pension System*, Chicago: University of Chicago Press, 1983).

The idea in those papers is that pensions can be used to bring about efficient retirement behavior without any explicit coercion by employers. By structuring the pension plan in a particular way, workers are induced to retire from the firm only when both sides are made better off as a result of the decision. An example (chosen just for illustrative purposes) makes the point. Suppose that a worker who is 60 years old is worth \$35,000 to the firm but is being paid \$45,000. Suppose further that the worker could obtain another job, not at his current salary but at \$36,000. Since he is worth more to the new firm than the old, it is efficient for him to accept the new job, but he will not do so because it would mean a \$9000 reduction in salary. Suppose, however, that he is entitled to receive a pension that is worth \$200,000 if he takes it at age 60, but only \$190,000 if he takes it at age 61. He earns \$45,000 but gives up \$10,000 to work one more year. If he were to retire at 60 and take the other job, he would receive \$200,000 + \$36,000 for the year, which exceeds the \$190,000 + \$45,000 that he receives if he stays. This provides an incentive to retire early. In fact, a judiciously structured pension plan can induce exactly the desired retirement behavior.

Of course, the annual pension flow rarely (if ever) declines with increases in years of service. However, the expected present value of that pension may well decline because it is received for fewer years and those years are later, on average. The value of virtually all defined-benefit pension plans will decline eventually. (Consider, as an extreme, a worker who worked until age 90. His per-year pension would be quite large, but he would expect to receive it for a very short period of time. The discounted value of that flow would be trivial.) The two papers cited above document the empirical importance of this theoretical possibility.

The data were generated from the 1975 Bankers Trust *Study of Corporate Pension Plans* and the 1980 *Corporate Pensions Plans Study*. Each study consists of a detailed verbal description of the pension plans of over 200 of the nation's largest corporations. These pension plans cover 8 to 10 million workers, approximately one-fourth of the entire covered population. The major empirical task was to convert the verbal descriptions into machine-readable data and then to calculate the expected present value of pension benefits at each age of retirement. The most important findings of those studies were:

(1) Most major pension plans in both 1975 and 1980 paid a larger expected present value of pension benefits for early retirement. This supports the idea that pensions act as an implicit early buy-out.

(2) The structure of pensions does not appear to have changed dramatically between 1975 and 1980, except for a substantial increase in the value of early retirement relative to normal retirement. Early retirement was more attractive in 1980 than in 1975 for a large number of workers. This is consistent with the decline in labor force participation among older workers.

In recent work ("Pensions and Turnover," 1985), Geoffrey Moore and I have examined the behavior of actual workers' responses to pension plans. This task

has been difficult until now because few data sets include information on the characteristics of workers along with information on their pension plans. For instance, the Bankers Trust data describe pensions but tell us nothing about the workers in those plans. In the past few months, we have acquired a data set that provides information (including a salary history) on all workers enrolled in six plans and a detailed description of the plans themselves. This permits us to estimate the effect of differences in the plans on worker turnover behavior.

The approach that we used involved thinking of working an additional year as equivalent to buying an option whose value depends on the worker's entire pension stream. This specification allows us to examine the effects of the pension on worker turnover rates. As expected, these effects are stronger for older workers than for younger ones. For old workers, we estimate that the annual turnover rate in firms without any pensions is twice as high as the average turnover rate in a firm with the average pension in the sample. (Turnover rates were quite low, however—only 4 percent per year—so a doubling is not as staggering as it seems.)

What Do Pensions Do?

The early empirical work on pensions suggested that incentive effects may be quite subtle. In order to determine why pensions exist, it is necessary to understand the effects on worker behavior of the various provisions and kinds of pension plans. Only by knowing what the plans actually do can we hope to know why they exist.

"Incentive Effects of Pensions" (in D. A. Wise, ed., *Pensions, Labor, and Individual Choice*, Chicago: University of Chicago Press, forthcoming Fall 1985) examines the types and provisions of plans in the United States. The effects of pension plans are often indirect, sometimes quite surprising, and depend critically on the way that workers view their pension plans. If workers think that any action to increase the level of their pension is exactly offset by a decrease in wages, then pension formulas can have no effect. That is, firms in a competitive market cannot afford to increase each worker's pension without correspondingly decreasing his salary, unless the worker's productivity goes up by exactly the same amount. If the worker believes this (correctly or not), pensions can have no effect. Furthermore, this implies that distortions caused by the pension can always be undone by a judiciously chosen wage function.

However, pensions have real effects when wage offsets are incomplete. Under defined-benefit pension plans, the worker is given both a salary and a pension formula. Although the firm as a whole must expect to break even, at least, on total compensation, no move by any one worker to increase his own pension need result in a direct reduction in his wages. As a consequence, pensions may have a number of effects on worker behavior.

The Effect of Default Risk on Bonds

Jess B. Yawitz

Perhaps most importantly, pattern plans (defined-benefit pension plans that do not depend explicitly on final salary) are efficient while conventional plans (which gear the pension flow to final salary) are not. This is because conventional plans provide too strong an incentive for increased work. When a worker's pension depends on his final year's salary, he tends to work to the point where his additional work is worth less than his foregone leisure.

Complete and immediate vesting is a necessary condition for pension plans to be fully efficient. Incomplete vesting results in too little work by some and too much by others because it creates a system of cross-subsidization. This inefficiency, but widespread existence of imperfectly vested pension plans, suggests that determining which workers are likely to stay on the job may be an important problem in labor markets.

As it turns out, some of the inefficiencies that pension formulas create may be undone by specifying minimum effort levels. Thus, piece rate workers, who choose their own effort levels, should not be offered conventional pension formulas. Pattern plans are economically more appropriate for workers who choose their own effort or hours.

Pensions and Earnings Inequality

Women generally have lower annual earnings and wage rates than men, and blacks have lower earnings and wages than whites. If pensions are an important part of total compensation, it is important to know whether their existence mitigates or exacerbates these inequalities.

This is the question addressed in E. P. Lazear and S. Rosen, "Pension Inequality" (NBER Working Paper No. 1477, October 1984). Using the Bankers Trust pension data sets, described above, and the 1979 Current Population Survey, we found that pension plans contribute to black/white inequality but leave male/female inequality essentially unchanged among whites. Even though women are less likely to receive pensions than men, those women who do receive pensions enjoy relatively generous ones. Of course, the average female pension is smaller than the average male pension, but the difference is not as pronounced as the wage differential. Among blacks, pensions exacerbate sex differences.

For men, pensions increase black/white inequality because blacks are less likely to have pensions and because the pensions are lower on average. They are lower because of shorter tenure at retirement and because of lower final average salaries for blacks.

Questions about bond prices and interest rates have occupied a considerable part of my research over the last ten years. Within this area, I have considered the measurement and management of interest rate risk from the perspective of purchasers of fixed-income securities. A second line of research that I will describe here involves the risk structure of interest rates: specifically, the effect the risk of default has on bond prices (yields). In two NBER Working Papers, I attempt to estimate the probabilities of default directly and then to address the issue of default within the broader context of bond ratings.

Taxes, Default Risk, and Yield Spreads¹

An impressive number of new financial instruments have been introduced successfully in recent years. The fixed-income market has been particularly innovative in putting forth "bonds" that carry a host of specific features, including small or zero coupons at original issue, variable coupon rates, detachable warrants, and puts and calls. Not surprisingly, a large and expanding literature has also developed to explain the yield spreads between different fixed-income securities.

My paper with Maloney and Ederington represents an extension and integration of recent empirical and theoretical research on default risk and taxability. Its purpose is to develop and test a model of interest rate spreads that incorporates in a theoretically correct manner both the effect of taxes and the differences in default probabilities. The theoretical model is an extension of earlier work on default² that takes explicit account of tax effects. While there is a considerable literature on the effect of taxability on rate spreads, no previous study (of which we are aware) considers tax consequences of default.

There is another important and fundamental difference between our approach to explaining yield spreads and the approach most commonly taken in the literature. Unlike most of the previous work, our research does not begin with a model of yield spread that attempts to explain differences in yields. Rather, we begin with a model of expected return or pricing, which can then be expressed in the yield spread format. This leads to a

¹J. B. Yawitz, K. J. Maloney, and L. H. Ederington, "Taxes, Default Risk, and Yield Spreads," NBER Working Paper No. 1215, October 1983.

²See H. Bierman and J. Hass, "An Analytical Model of Bond Risk Differentials," *Journal of Financial and Quantitative Analysis*, December 1975; and J. B. Yawitz, "An Analytical Model of Interest Rate Differentials and Different Default Recoveries," *Journal of Financial and Quantitative Analysis*, September 1977.

superior theoretical formulation that can be tested empirically without many of the problems inherent in the alternative approach. For example, we develop and test a model that relates the municipal bond yield to three factors: the tax rate, the probability of default on the municipal bond, and the yield on an equal-maturity government bond. Beginning with a pricing model, we find that these three factors enter the regression equation in a specific multiplicative way, different from what is usually assumed and difficult to ascertain by starting with a yield spread model.

Our simple theoretical model expresses the yield on tax-free (municipal) bonds as a function of a single independent variable: the yield on taxable bonds. One key insight is that the constant and slope coefficients estimated from the simple linear equation that links these two yields are specific nonlinear functions of the breakeven tax rate and the default probabilities of the two securities. While a similar equation has been estimated many times in the literature, the coefficients were not properly interpreted.

The Default Model

In our model that relates yields on various types of securities, we hypothesize a simple default process: we assume that the probability that a borrower makes the full contractual payment in the stated period, conditional on not having defaulted in an earlier period, is constant over time. If default occurs, no payment is made.

This model of the default process has been used previously to demonstrate that in a risk-neutral world without taxes, the yield on a risky bond can be expressed solely as a function of the risk-free bond yield. Furthermore, the slope and intercept coefficients of this relationship are functions only of the default probability.

In our paper, we retain this view of the default process while explicitly introducing taxes into the analysis. We were surprised to find that the tax implications of default have not previously been incorporated into analytical or empirical models of interest rate levels and spreads. We express the tax environment for fixed-income securities as follows:

(1) The coupon is either taxable as ordinary income or it is tax free, depending on the type of bond.

(2) In the event of default, no payment is made and the foregone principal is immediately deductible from taxable income. Whether complete deduction is applicable (ordinary loss) or the deduction is treated as a capital loss depends upon the tax status of the investor and may depend on the length of time the bond was held.

We can then show that for a given probability of default, the yield required by an investor to be indifferent between a risky and a riskless *tax-free* bond varies *inversely* with the investor's tax rate. Stated another way, the expected aftertax rate of return on a given risky tax-free bond varies *directly* with the investor's tax rate. The intuition here is straightforward. If a tax-free bond makes its promised interest payment, then

the realized aftertax return is independent of the investor's tax rate. On the other hand, if the bond defaults, then the investor's loss per dollar of principal is lower as tax rates get higher, since the government bears a portion of the loss as a tax deduction. Since the after-tax loss in the event of default is lower for investors in high tax brackets, they require a lower yield on the bond. The investor's tax rate is relevant for comparing tax-free bonds with different probabilities of default because of the asymmetric effect of taxes on the two return outcomes. If payment is made, the tax system is irrelevant. If default occurs, the tax rate determines the size of the loss to the investor.

This discussion also suggests that a clientele effect will be present in the ownership of tax-free bonds. Specifically, investors with tax rates lower (higher) than the breakeven rate will be attracted to bonds with low (high) risk.

Empirical Results

We confined our empirical investigation to two particular types of bonds: municipals and governments. Since government bonds are risk free, we are able to obtain a point estimate of the probability of default for the risky (municipal) security. We selected these particular yield series in order to reduce the possible complications from the ability to call bonds and to minimize the measurement error problem that is common to many studies of yield spreads.

The data in our study are monthly observations of the yields required to sell new municipal and government securities at par. All yields are annualized. Therefore, the estimated probabilities of default are also annualized measures. The sample begins in August 1965 and ends in March 1981; it includes observations with maturities of 20, 10, 5, and 1 years. In addition, the municipal bond data include observations from three different grades: prime, good, and medium.

The empirical results provide strong evidence that our model of the relationship between a riskless taxable bond and a risky tax-free bond is reasonable. The model explains over 90 percent of the variation in municipal bond rates and the *t*-statistics are significant at the 1 percent level in every case. In addition, the estimated values of default probabilities and the breakeven tax rate are quite reasonable. The estimated probabilities of payment are consistently quite high but less than one in every case. Our results also suggest the following observations and conclusions:

(1) With only one exception, the estimated probability of payment for equal maturity bonds is lower as the municipal bond's rating gets lower.

(2) There appears to be little systematic relationship between estimated tax rates and bond ratings. There is a tendency for the estimated tax rate to decrease as one moves from good to medium bonds, but the relationship between prime and good bonds was very inconsistent.

(3) In most cases the estimated tax rate increases as maturity increases for bonds of a given grade. This

result, which is consistent with a market segmentation hypothesis in the municipal market, could also be caused by the effect of callability that would tend to increase the yields on longer-term municipal bonds, *ceteris paribus*.

The Information Content of Bond Ratings³

In a second paper, coauthored by Ederington and Roberts, we examine the question of whether Moody's and Standard & Poor's bond ratings provide information to bond markets in the same way that accounting information available to the public does. Our analysis relates the risk structure of interest rates at a given time to both ratings and readily available financial accounting statistics. Specifically, we consider three questions:

(1) Do yields (prices) on bonds indicate that the market views ratings as reflecting only information that is readily available, providing no new information?

(2) Do yields indicate that the market views all relevant information about an issue's creditworthiness as adequately represented by its rating(s)?

(3) Does the information content of ratings decline over time, indicating that market participants regard recently released ratings as better indicators of risk of default than ratings that have not been reviewed recently?

In addition, we examine the relative importance of Moody's versus Standard & Poor's ratings.

The Model

To determine the information content of ratings on bond yields, we use a regression analysis in which the yields-to-maturity on various bond issues are related to dummy variables that represent Moody's and Standard & Poor's ratings and to variables that represent readily available information on the issuing firm and the bond issue itself. The explanatory power of this formulation provides a benchmark for accessing the relative importance of these two sources of information. The hypothesis that ratings provide no information beyond that which is publicly available implies that the explanatory power of the equation will not be reduced significantly when ratings are deleted. Similarly, the hypothesis that the market bases its evaluation of creditworthiness solely on ratings implies that the explanatory power will not be reduced significantly when the set of publicly available information is deleted.

In order to test these hypotheses, we collected data on a sample of bonds issued by industrial and commercial firms. Since we were concerned that dealer quotes on thinly traded issues might not reflect true market

equilibrium prices, we restricted the sample to bonds listed on the New York or American Exchanges traded during the three days from February 27 through March 1, 1979 (a period in which gainers nearly equaled losers). The sample was also restricted to bonds or notes with at least five years to maturity, to bonds rated by both Moody's and Standard & Poor's, and to issues of firms with five years of data on the COMPUSTAT tape prior to December 31, 1978. Finally, we included no more than two bond issues of any one firm. Our final sample consisted of 176 bond issues.

While financial analysts have suggested that several measures are useful in assessing a bond's creditworthiness, most seem to fall in the following categories: (1) measures of balance sheet leverage; (2) measures of interest coverage, profitability, and/or cash flow; and (3) characteristics of the bond contract—for example, the subordination status. In addition, rating studies have found a strong correlation between firm size and ratings, and market participants may regard large firms as less risky, *ceteris paribus*. On this basis, we chose the following variables reflecting publicly available information for inclusion in the data set: (1) the ratio of long-term debt to total capitalization; (2) average interest coverage, measured as pretax income (before extraordinary items) plus interest charges divided by interest charges; (3) deviations of coverage from a five-year trend line, measured as the square root of the sum of the squared deviations; (4) the firm's total assets; and (5) a dummy, equal to one if the issue was subordinated and zero otherwise.

Empirical Results

We find that the set of publicly available accounting information explains slightly more of the yield variation among different corporate bonds than do ratings. This suggests that this small set of four accounting measures and the indicator of subordination status have at least as much information content as Moody's and Standard & Poor's ratings combined. However, this does not mean that the ratings provide no additional information, since they may reflect different aspects of creditworthiness.

In order to test the hypothesis that the ratings bring no information to the market beyond that contained in the four accounting measures and subordination status, we estimated an equation including both ratings and accounting measures. Our results suggest that ratings do provide additional information to the marketplace. Likewise, we find that the set of accounting variables also adds information beyond that contained in the ratings.

Previous studies have consistently found that ratings are strongly related to accounting measures of creditworthiness and to subordination status. Our findings indicate that accounting measures provide incremental explanatory power over and above the rating variable; it would seem that the market does not view ratings as incorporating all information on credit-

³L. H. Ederington, J. B. Yawitz, and B. E. Roberts, "The Informational Content of Bond Ratings," NBER Working Paper No. 1323, April 1984.

worthiness. There are three possible explanations for this finding: (1) new and recently revised ratings fully incorporate information on creditworthiness but older ratings do not; (2) the weight or importance that the market attaches to the accounting variables differs from the weight attached to them by the rating agencies; and (3) accounting variables explain intrarating yield differentials only—they are significant only because a given rating covers a range, not an exact level, of creditworthiness.

While the primary purpose of our tests was to measure the information content of bond ratings, we conducted a series of additional tests that suggest the following conclusions. First, the market apparently views Moody's and Standard & Poor's ratings as interchangeable and as equally reliable indicators of an issuer's creditworthiness. It would be interesting to see whether this result holds for specific industries as well. We also found a weak statistical relationship between the time when a rating was last reviewed and the importance of ratings in explaining bond yields. Nevertheless, both publicly available accounting information and ratings are important for new and old issues.

Economic Outlook Survey

First Quarter 1985

Victor Zarnowitz

Most respondents to the November survey accurately predicted that last summer's sharp slowdown would be short-lived, but they failed to appreciate the strength of the revival. The compilers of official statistics made a similar error in the earliest estimate for 1984:4. According to the February survey of 24 professional forecasters taken by NBER and the American Statistical Association, forecasts for the year ahead tend to project moderate growth, slowly rising inflation, and irregular movements rather than strong trends in interest rates.

Some Recent Events and Their Interpretation

Real growth in 1984:4 is now appraised at 4.9 percent, up from the flash report of 2.8 percent and the recent revision to 3.9 percent. (Here as elsewhere annual rates, a.r., are used.) One reason for these vagaries is that the preceding slowdown was initially underestimated, too. Also, relatively small errors in the levels of quarterly series produce large errors in the derived measures of percentage changes, a.r. The measurement errors revealed by subsequent revisions are basically unpredictable, as are short random changes in economic conditions that are often difficult to identify even after the fact. Most of the upward revision in real GNP for the last quarter is accounted for by unexpected and probably unique shifts in foreign trade statistics. Imports rose 55 percent in 1984:3 and fell 32 percent in 1984:4. While output growth increased from 1.6 percent to 4.9 percent, growth in real domestic expenditures (GNP plus imports minus exports of goods and services, in constant dollars) slowed from 5.4 percent to 0.7 percent. This resulted in large deviations between the paths of domestic spending and output, which are unlikely to continue. The dollar appreciated further in the current quarter, and imports may have strongly rebounded. A major upturn in domestic spending will be required for the growth in total production and employment to be maintained.

It should be noted that most of the collected forecasts were made before the latest upward revision of the GNP data. Judging from past experience and comparisons with more recent forecasts, this circumstance should have mixed effects: some downward bias in the levels for this and the next quarter, much less of any systematic impact on the more distant targets and the predictions of percentage change. Actually, the new uncertainties about the future course of monetary policy, tax reform, the dollar, and interest rates have tended to make many of the latest forecasts somewhat less optimistic.

Moderate Growth in Output and the Probabilities of Alternative Outcomes

In the year ahead, 1985:1–1986:1, total output of the economy is expected to rise 3.6 percent according to the median forecast from the survey. The corresponding figure for the year-to-year growth, 1984–85, is 3.8 percent. The quarterly averages decline gradually from 4.1 percent to 3.2 percent, a.r.

Survey participants report the probabilities they attach to the alternative intervals of year-to-year change in real GNP. The means of these assessments for 1984–85 are distributed as follows:

<i>Percentage of Responses</i>			
6.0 Percent or More	4.0 to 5.9 Percent	2.0 to 3.9 Percent	Less than 2.0 Percent
8	36	43	13

Projections of GNP and Other Economic Indicators, 1985

	Annual						Percent Change 1984 to 1985	
	1984 Actual	1985 Forecast						
1. Gross National Product (\$ billions)	3661.3	3933.0				7.4		
2. GNP Implicit Price Deflator (1972 = 100)	223.4	231.1				3.4		
3. GNP in Constant Dollars (billions of 1972 dollars)	1639.0	1702.0				3.8		
4. Unemployment Rate (percent)	7.5	7.0				-0.5 ¹		
5. Corporate Profits After Taxes (\$ billions)	145.8	153.0				4.8		
6. Nonresidential Fixed Investment (billions of 1972 dollars)	205.2	224.0				9.3		
7. New Private Housing Units Started (annual rate, millions)	1.7	1.7				-2.6 ²		
8. Change in Business Inventories (billions of 1972 dollars)	24.2	15.3				-8.9 ³		
9. Treasury Bill Rate (3-month, percent)	9.6	8.4				-1.1 ¹		
10. Consumer Price Index (annual rate)	4.4	3.9				-0.6 ¹		

	Quarterly						Percent Change	
	1984 Actual	Q1	1985 Forecast			1986 Q1		
				Q2	Q3	Q4		Q4 84 to Q4 85
1. Gross National Product (\$ billions)	3752.5	3821.0	3896.0	3971.0	4045.0	4125.0	7.8	8.0
2. GNP Implicit Price Deflator (1972 = 100)	225.9	227.9	229.8	232.0	234.8	236.9	3.9	4.0
3. GNP in Constant Dollars (billions of 1972 dollars)	1661.1	1678.0	1694.0	1710.0	1725.0	1739.0	3.8	3.6
4. Unemployment Rate (percent)	7.2	7.2	7.0	7.0	6.9	6.8	-0.3 ¹	-0.4 ¹
5. Corporate Profits After Taxes (\$ billions)	147.5	146.0	152.0	157.0	160.0	161.5	8.5	10.6
6. Nonresidential Fixed Investment (billions of 1972 dollars)	215.1	219.0	222.9	226.0	228.5	232.0	6.2	5.9
7. New Private Housing Units Started (annual rate, millions)	1.6	1.7	1.7	1.8	1.7	1.6	9.7 ²	-3.8 ²
8. Change in Business Inventories (billions of 1972 dollars)	14.2	14.5	16.0	16.0	17.0	16.3	2.8 ³	1.8 ³
9. Treasury Bill Rate (3-month, percent)	9.0	8.0	8.2	8.5	8.8	8.7	-0.1 ¹	0.7 ¹
10. Consumer Price Index (annual rate)	3.1	3.5	3.8	4.3	4.5	4.7	1.4 ¹	1.2 ¹

SOURCE: National Bureau of Economic Research and American Statistical Association, Business Outlook Survey, March 1985. The figures on each line are medians of twenty-four individual forecasts.

¹Change in rate, in percentage points.

²Apparent discrepancy in percent change is caused by rounding.

³Change in billions of dollars.

About 56 percent of the distribution falls below 4 percent, down from 67 percent in the November 1984 survey. Thus the odds shifted toward higher rates but they still favor heavily the range of moderate growth centered near but probably below 4 percent.

The assessments of the chances in 100 that real GNP will decline average 5, 9, 13, and 17 for the four successive quarters of 1985. This is very different from the corresponding figures three months ago (22, 19, 19, and 21). The risk of a recession this year, which was viewed as significant but not high, decreased further. However, the probability that the economy will peak is seen as rising into the next year. (The average for 1986:1 is 22 chances in 100.)

Small Cuts in Unemployment and Gains in Industrial Production

The rate of unemployment is expected to decrease

gradually to 7.0 percent in mid-1985 and 6.8 percent in 1986:1, according to the median forecast. Five respondents see it as falling further into the 6.2-6.7 percent range, four as staying higher or rising to 7.2-7.8 percent. The average for 1985 is 7.0 percent. (The outcome for 1984 was 7.5 percent.)

The index of industrial production (output of manufacturing, mining, and gas and electric utility industries) gained 10.8 percent in 1983-84, but the average forecast is that it will rise only 4.0 percent in 1984-85 and 3.8 percent in 1985:1-1986:1. Spending on domestically produced goods, particularly durables, will continue to be adversely affected by attractively priced imports.

Inflation to Increase Less than Previously Expected

The consumer price index is now forecast to rise 3.9

percent in 1985, less than the recorded rate of 4.3 percent in 1984. In November 1984 no reduction of this measure of inflation was expected. However, the quarterly forecasts still trace a rise in the CPI changes (a.r.) from 3.5 percent in 1985:1 to 4.7 percent in 1986:1. Only three individuals do not expect inflation to increase, but the dispersion in these measures is large, the range being 3-6 percent for 1986:1.

The median predictions of inflation in terms of the GNP implicit price index are 3.4 percent for 1984-85 and 3.9 percent for 1985:1-1986:1. Percentage distributions of means of the individual probabilistic forecasts show clearly a shift in expectations toward lower IPD inflation in 1984-85:

	Percentage of Responses			
	8.0 Percent or More	6.0 to 7.9 Percent	4.0 to 5.9 Percent	Less than 4.0 Percent
November 1984	1	8	56	35
March 1985	1	9	30	60

Small Changes in Interest Rates, Mostly Up at the Short End

The three-month Treasury bill rate is expected to increase from slightly less than 8.0 percent in 1985:1 to 8.7 percent in 1986:1, according to the median forecast. Only 20 percent of the respondents do not predict that the bill rate will rise in the year ahead, but many of the quarterly changes are small, and few constitute strong trends in either direction.

The yield on new high-grade corporate bonds will decline slightly in this quarter and the next, then rise in the second half of 1985, and fall again early in 1986 to about the current level estimated at 12.3 percent. Here too the predicted changes are mostly small and even more mixed, with some 60 percent of the respondents foreseeing overall rises and 40 percent declines or no change between 1985:1 and 1986:1.

The average levels of the rates will be lower in 1985 than in 1984: the median forecasts are 8.4 percent and 12.4 percent for the bill rate and the bond yield, respectively. (The actuals for last year were 9.6 percent and 13.4 percent.)

Consumption to Rise in Step with GNP; Housing Steady or Weaker

Total consumption expenditures in constant dollars will rise 4.9 percent and 4.1 percent, a.r., in this quarter and the next but only 3.6 percent in the second half of 1985 and 2.8 percent in 1986:1. The average forecasts are 3.9 percent in the second half of 1985 and 2.8 percent in 1986:1. The average forecasts are 3.9 percent for 1984-85, 3.4 percent for 1985:1-1986:1. These rates of growth are similar to those for real GNP as a whole.

Housing starts, in millions of units, a.r., will average 1.70 in 1985 and 1.63 in 1986:1, slightly lower than in 1984 (1.74) and 1985:1 (1.69). Residential fixed investment in 1972 dollars will fluctuate narrowly between the levels of \$59 billion and \$68 billion.

Fair Gains in Business Investment and Profits

Nonresidential fixed investment in constant dollars will increase 9.3 percent in 1984-85 and 5.9 percent in 1985:1-1986:1. This sector is no longer booming but is still a source of relative strength. A few respondents foresee large increases and a few large decreases in inventory investment, but most predict merely that the changes will be moderate in the positive range.

Corporate profits after taxes in current dollars are expected to rise 10.6 percent in the year ahead. This is an improvement over the recent performance. (The gain projected for 1984-85 is only 4.8 percent.)

Government Spending and Policies and Net Exports

Federal government purchases of goods and services in constant dollars will rise 7.8 percent in 1984-85 and 3.2 percent in 1985:1-1986:1, which indicates that some slowing of the expenditures stream is anticipated. The corresponding median forecasts for state and local government purchases are 2.8 percent and 2.3 percent. Most forecasters assume a buildup of 5-7 percent in defense outlays; a few specify lower figures. Most also assume no substantial change in the current tax law but a few assume new legislation with poorly defined effects.

The assumptions about the course of monetary policy vary, but the most common one is that the growth of M1 will be in the 6-8 percent range.

Almost as many respondents assume that the dollar will weaken as that it will stay strong or get stronger. No one doubts that net exports will remain negative but the median forecast shows them as relatively stable, close to the level of -20 billions of 1972 dollars.

This report summarizes a quarterly survey of predictions by 24 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 Patrick Higgins of NBER, was responsible for tabulating and evaluating this survey.

Rudolph A. Oswald

Rudolph A. Oswald, who has served on NBER's Board of Directors since 1974, is director of the AFL-CIO's Department of Economic Research. Oswald received his B.A. from Holy Cross College, his M.S. from the University of Wisconsin, and his Ph.D. from Georgetown University. He also attended the University of Munich as a Fulbright Scholar.



Prior to 1976 when he was named director of economic research, Oswald served as assistant director of the AFL-CIO's Education Department; research director of the Service Employees International Union; economist at the AFL-CIO; research and education director of the International Association of Fire Fighters; and adjunct professor of economics at George Washington University. His writings frequently appear in the *American Federationist* and he often represents the AFL-CIO at congressional hearings.

Oswald also serves on a number of governmental and private boards and advisory committees. He is a member of the advisory committee on Trade Negotiations and the Services Policy Advisory Committee to

the U.S. Special Trade Representative; and the Labor Research Advisory Council to the Bureau of Labor Statistics of the U.S. Department of Labor. He serves on the Board of the Joint Council on Economic Education, the Consumer Energy Council of America, and the Industrial and Labor Relations Advisory Council of Cornell University. He is also a past president of the Industrial Relations Research Association.

Oswald has four children and one granddaughter and lives in Potomac, Maryland.

Stephen Stamas

Stephen Stamas, a director of NBER since 1978, is a vice president of Exxon Corporation. Since 1973, he has been in charge of Exxon's worldwide public affairs; he is also chairman of the Exxon Education Foundation.

Stamas holds an A.B. and Ph.D. from Harvard University, and a Bachelor of Philosophy degree from Oxford where he was a Rhodes Scholar. He has been continuously associated with Exxon since 1960 except for a year of service as deputy assistant secretary for financial policy of the U.S. Department of Commerce. Early in his career, Stamas also worked for the U.S. Bureau of the Budget and for the Development Loan Fund in Washington, D.C.

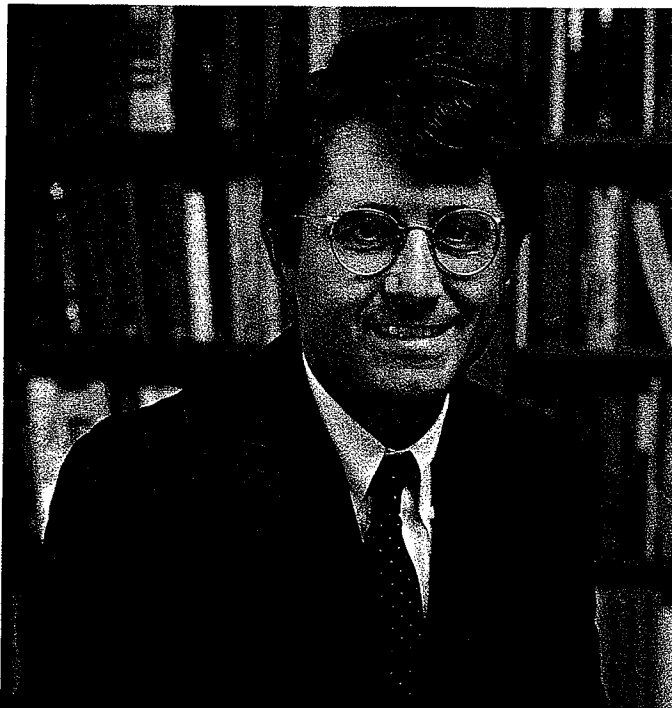


Stamas is currently president of the New York Philharmonic and of Harvard University's Board of Overseers. He is also a member of the board of the American Council for the Arts, the Council on Foreign Relations, and the New York Public Library.

Stamas and his wife, Elaine, have two children.

Jess B. Yawitz

Jess B. Yawitz, research associate in NBER's Program in Financial Markets and Monetary Economics since 1983, is the John E. Simon Professor of Finance at Washington University (St. Louis). Yawitz received his A.B., M.A., and Ph.D. in economics from Washington University and joined the faculty of its School of Business in 1971. He was promoted from assistant to associate professor in 1976 and to professor in 1979.



In 1980, Yawitz was appointed director of the school's Institute of Banking and Financial Markets, and in 1983 he was named chairman of the tenured faculty. Yawitz was also a faculty member in the Graduate School of Banking at Southern Methodist University from 1975 to 1981 and a visiting scholar at Stanford University's School of Business in the fall of 1978.

Yawitz, whose teaching interests include money and capital markets, banking, macroeconomics, and international finance, has served as referee and associate editor for a number of scholarly journals. Also, in 1984 he was on the advisory board of the *Journal of Portfolio Management*. Much of Yawitz's scholarly research has been published in leading financial journals and in the *American Economic Review*. He was also coauthor of a 1983 text on macroeconomics published by Prentice-Hall.

Yawitz and his wife have two sons, aged 5 and 8. Among his hobbies are running and downhill skiing.

Conferences

Public Sector Payrolls

NBER sponsored a conference on public sector payrolls in Williamsburg, Virginia, on November 15-17. The agenda, coordinated by Project Director David A. Wise, was:

Charles F. Manski, NBER and University of Wisconsin, "Academic Ability, Earnings, and the Decision to Become a Teacher" (NBER Working Paper No. 1539)

Discussant: Herman B. Leonard, NBER and Harvard University

Ronald G. Ehrenberg, NBER and Cornell University, and Robert S. Smith, Cornell University, "Comparable Worth in the Public Sector" (NBER Working Paper No. 1471)

Discussant: James L. Medoff, NBER and Harvard University

Steven F. Venti, NBER and Dartmouth College, "Wages in the Public and Private Sectors"

Discussant: Sharon Smith, American Telephone and Telegraph

Douglas Phillips, Harvard University, and David A. Wise, NBER and Harvard University, "Military versus Civilian Pay: A Descriptive Discussion"

Herman B. Leonard, "The Financial Statutes of the Military Retirement System"

Discussant: Harvey S. Rosen, NBER and Princeton University

Howard Frant, Harvard University, and Herman B. Leonard, "State and Local Pension Plans"

Discussant: Edward P. Lazear, NBER and University of Chicago

David T. Ellwood, NBER and Harvard University, and David A. Wise, "Military Hiring and Youth Employment," and "Uncle Sam Wants You—Sometimes: Military Enlistments and the Youth Labor Market"

Discussant: Charles C. Brown, NBER and University of Maryland

Jon Crane, Harvard University, and David A. Wise, "Military Service and the Civilian Earnings of Youth"

Discussant: D. Alton Smith, U.S. Military Academy

Richard B. Freeman, NBER and Harvard University, "Changes in Public Sector Employment and Changes over the Business Cycle"

Discussant: Sam Peltzman, University of Chicago

Several of the papers presented focus on compensation in the armed forces and its relation to compensa-

tion in the private sector, and on the interaction between military employment and youth employment in the private sector. Phillips and Wise find that potential compensation from a military career is considerably larger than what the typical enlisted personnel and officers would receive if they had a lifetime career in the civilian sector. The authors estimate that the total potential lifetime compensation of enlisted career military personnel is between 1.4 and 1.7 times the average lifetime compensation of high school graduates; the total potential compensation of officers is between 1.6 and 1.9 times the lifetime compensation of the average college graduate.

Much of this difference between military and civilian compensation is the result of the very generous military pension system. The public and private pension wealth at age 62 of career enlisted personnel is between 1.5 and 2.5 times the pension wealth of the typical high school graduate with a private pension. Career officers at age 62 have two to three times the public and private pension wealth of a typical college graduate with a private pension. The data also suggest that the military pension system provides a strong inducement for those with five or more years of service to remain for 20 years when their pension benefits become available. After that, pension benefits apparently provide a strong incentive for them to retire unless future promotions in the service and the resulting increase in pension wealth offset the otherwise foregone benefits.

“The total potential lifetime compensation of enlisted career military personnel is between 1.4 and 1.7 times the average lifetime compensation of high school graduates.”

In a related paper, Leonard analyzes the unfunded liability of the military retirement system and the alternative to it proposed by the Grace Commission. He concludes that the military retirement system represents an accumulated taxpayer debt of about \$525 billion. Its full funding rate is over 40 percent of payroll costs. (In a paper presented elsewhere, Laurence J. Kotlikoff and Wise find that the funding rate of the typical private pension plan is about 5 percent of payroll.) Individuals retiring with 20 years of military service often receive more in pension compensation than they did in wages over the period they worked.

The Grace Commission proposed a dramatic reduction in benefits. Pensions would be reduced in size, paid later in life, made shorter in duration, adjusted less than fully to offset inflation, and pegged to nominal salaries at retirement. Leonard concludes that for many military retirees, these changes would cut benefits by over 90 percent. He also concludes that the work incentives provided by the pension system would be changed substantially; the reduction in pension bene-

fits would amount to an overall pay cut of about 25 percent.

In another paper, Ellwood and Wise estimate the effect of military hiring of youth on the civilian employment of youth. They conclude that if a black youth is hired by the military, the total number of black youth employed is increased by one. That is, there will be no offset in the number of black youth employed in the civilian sector. They also conclude that military hiring of white youth is partially offset by reduced employment of white youth in the civilian sector, but the offset is considerably less than one and may be closer to zero.

In a companion paper, Ellwood and Wise examine military enlistments and the youth labor market. They find that the military does serve as a kind of employer of last resort for youth groups deemed “high quality” by the military. For these groups, military enlistment is highly sensitive (in percentage terms) to economic conditions, but not very sensitive to their total employment, since only small proportions of these groups enlist even in poor economic times. By contrast, military enlistments seem to exaggerate the civilian economic conditions of those on the bottom rung of the military hiring ladder. They are in large excess supply to the military and in poor economic times they tend to be supplanted by more qualified enlistees. The Ellwood-Wise results also imply that an expanding military will disproportionately benefit groups who generally fare less well in the labor market, such as nonwhites and high school dropouts.

Crane and Wise examine military service and the civilian earnings of youth. They conclude that among the potential enlistees—individuals with high school degrees and no further education—those who in fact join the military are, by standard measures of quality, very similar to those who do not join. The two groups have similar academic test scores and they performed at approximately the same level in their high school classes. Both groups, however, are quite different from those high school graduates who go on to four-year colleges.

Crane and Wise also find that job experience in the civilian labor market is more valuable than job experience in the military for obtaining wage increases in the civilian sector. However, military experience does contribute to earnings in the civilian labor market. These results, the authors emphasize, do not mean that earnings in the military sector are lower than those in the private sector. Nor do the results imply that military service is a poor choice for those who enlist, even if they intend ultimately to follow a career in the civilian sector. Those who choose to enlist in the military before joining the private labor force may have faced relatively poor employment experiences in the private sector upon graduation from high school.

Venti examines the comparability of wages in the federal and private sectors. He concludes that, although much of the gross differential in average wages can be explained by differences in individual attributes, the federal sector still pays men about 6 percent more than those in the private sector. Women in the public sector

earn approximately 13 percent more than their counterparts in the private sector. Venti also attempts to estimate wage rates that would be required to eliminate queues for federal sector jobs. He concludes that in 1982 this could have been accomplished with an 8 percent reduction in federal sector wages paid to men and a 16 percent reduction in wages paid to women.

“The federal sector still pays men about 6 percent more than those in the private sector.”

In a related paper, Freeman asks how public sector wages and employment respond to economic conditions. Contrary to the view that pay in the public sector is inflexible, he finds that the pay of public sector workers relative to private sector workers varies greatly over time and that the relatively highly paid public sector worker of the early 1970s lost most of his advantage over the ensuing decade. Freeman also concludes that in the public sector workers who tend to be the most highly paid relative to private sector workers are blacks and women. However, estimates of the differentials in public and private sector pay vary greatly depending on the data that are analyzed: Current Population Survey comparisons and Bureau of Labor Statistics surveys of wage rates give quite different results. Finally, and not surprisingly, Freeman finds that a major determinant of wages and employment in the state and local public sector is the size of the corresponding budget. At the state and local level, moreover, an increase in the ratio of budgets to GNP raises relative employment much more than it raises wages.

Frant and Leonard examine the incentive effects of state and local government pension plans on workers. They find that pensions are an important component of labor income in the state and local public sector. To fully fund these plans, funding rates would need to average about 15 percent of total compensation. (Comparable private sector funding rates are about 5 percent, according to Kotlikoff and Wise.) Frant and Leonard also find that the state and local pension plans differ dramatically among jurisdictions in form, timing, and level and, as a result, in the incentives that they provide workers. Some are so complex that their incentive patterns appear to have arisen more by accident than by design, the authors conclude. The plans may also be too complex to be fully understood by the covered workers.

Ehrenberg and Smith emphasize the issues that arise in attempts to implement policies on comparable worth. They find that existing estimates of comparable worth wage gaps in Connecticut, Minnesota, and Washington are relatively insensitive to the functional form of the earnings equation estimated. On the other hand, the authors express considerable skepticism about what job evaluation systems are actually measuring. They conclude that if evaluation systems are to be used in

studies of comparable worth, more thought should be given to their design.

Manski's paper examines academic ability, earnings, and the decision to become a teacher. Manski finds that the choice of teaching as an occupation is inversely related to academic ability. In addition, teachers earn much less on average than other working college graduates of the same sex and comparable academic ability. Furthermore, teachers' earnings tend to rise only slightly, if at all, with academic ability. Manski's analysis suggests that, in the absence of a minimum ability standard, increases in teacher earnings would yield substantial growth in the number of people seeking teaching jobs but minimal improvement in the average academic ability of teachers. If teacher salaries were not increased, establishing a minimum ability standard would improve the average ability of the teaching force but reduce its size. Thus, the average ability of the teaching force can be improved and its size maintained only if minimum ability standards are combined with sufficient salary increases. Manski estimates that the average academic ability of teachers could be raised to the average of all college graduates if, for example, a minimum SAT score (verbal + mathematics) of 800 were required for teacher certification, and teacher salaries were raised by about 10 percent above their present levels.

It is anticipated that a volume of the papers and discussions will be published by the University of Chicago Press. Its availability will be announced in a subsequent issue of the *NBER Reporter*.

Conference Calendar

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

Organizations wishing to have meetings listed in the Conference Calendar should send information, comparable to that given below, to Conference Calendar, National Bureau of Economic Research, 1050 Massachusetts Avenue, Cambridge, MA 02138. Please also provide a short (fewer than fifty words) description of the meetings for use in determining whether listings are appropriate for inclusion. The deadline for receipt of material to be included in the Summer 1985 issue of the *Reporter* is May 15. If you have any questions about procedures for submitting materials for the calendar, please call Kirsten Foss at (617) 868-3900.

May 1-3, 1985

Annual Meeting: Benefit Coalition for Our Political Capital,
Association of Private Pension and Welfare Plans

May 3, 1985

Program Meeting: Labor Studies, NBER

May 9-10, 1985

Money and Financial Markets Conference, NBER

May 17-18, 1985

Preconference: Research Project on Europe-U.S. Trade Relations,
NBER

May 20-21, 1985

Spring Symposium, National Tax Association*

May 22-24, 1985

Konstanz Seminar on Analysis and Ideology, University of Rochester

May 27-31, 1985

Interlaken Seminar on Analysis and Ideology, University of Rochester

June 3-5, 1985

International Meeting, International Association of Energy
Economists*

June 23-25, 1985

International Seminar on Macroeconomics, NBER

June 30-July 4, 1985

Annual Conference, Western Economic Association*

July 26, 1985

Program Meeting: Economic Fluctuations, NBER

August 4-7, 1985

Annual Meeting, American Agricultural Economics Association*

August 5-8, 1985

Annual Meeting, American Statistical Association*

August 17-24, 1985

World Congress, Econometric Society

August 26-28, 1985

Income and Wealth: Productivity Growth in the United States and
Japan, NBER

August 26-30, 1985

Annual Congress, International Institute of Public Finance

September 11-14, 1985

17th CIRET Conference, Center for International Research on
Economic Tendency Surveys

September 12-13, 1985

Panel on Economic Activity, Brookings Institution

September 26-27, 1985

Conference on Housing Finance, NBER

September 29-October 2, 1985

Annual Meeting, National Association of Business Economists*

October 1985

Conference, Atlantic Economic Society*

October 13-16, 1985

Annual Conference, National Tax Association*

November 6-8, 1985

North American Meeting, International Association of Energy
Economists*

November 7-9, 1985

Causes and Consequences of Non-Replacement Fertility, Hoover
Institution

November 24-26, 1985

Annual Meeting, Southern Economic Association*

December 14-15, 1985

Conference on International Aspects of Fiscal Policies, NBER

December 28-30, 1985

Annual Conference, American Economic Association*

March 21, 1986

Program Meeting: Economic Fluctuations, NBER

April 3-5, 1986

Annual Meeting, Midwest Economics Association

April 17-19, 1986

Conference on Public Sector Unionism, NBER

May 1986

Conference on Europe-U.S. Trade Relations, NBER

June 24-26, 1986

International Seminar on Macroeconomics, NBER

June 25-28, 1986

Summer Meeting, Econometric Society

July 27-31, 1986

Annual Meeting, American Agricultural Economics Association*

August 18-21, 1986

Annual Meeting, American Statistical Association*

September 13-17, 1986

Annual Meeting, National Association of Business Economists*

December 28-30, 1986

Annual Conference, American Economic Association*

August 2-5, 1987

Annual Meeting, American Agricultural Economics Association*

August 17-20, 1987

Annual Meeting, American Statistical Association*

September 27-October 1, 1987

Annual Meeting, National Association of Business Economists*

August 8-11, 1988

Annual Meeting, American Statistical Association*

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

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

International Aspects of Fiscal Policies: A Call for Papers

On December 14 and 15, 1985, the National Bureau of Economic Research will hold a conference in Cambridge on International Aspects of Fiscal Policies. The program, being organized by Professor Jacob A. Frenkel of the University of Chicago and the NBER, will consist of seven papers with two formal discussants assigned to each paper. The papers will be summarized in the *NBER Reporter*.

The conference will be broad enough to accommodate a wide variety of issues related in one way or another to international macroeconomics. Appropriate for the conference are papers dealing with the following topics: the international effects and transmission of government spending and budget deficits; fiscal policies in intertemporal macroeconomic models; the interaction among fiscal policy, the current account, and the capital account; fiscal policies and capital formation; the interaction between fiscal and monetary policies in an open economy; fiscal policy, exchange rates, and interest rates; the role and effectiveness of fiscal policies under alternative exchange rate regimes; fiscal policies and international capital movements; the effects of fiscal policies in industrial countries on capital flows to developing countries; fiscal policies and the international debt problem; fiscal policies and international financial markets; the role of fiscal policies in economic stabilization and liberalization programs; the interaction between fiscal policies and commercial policies; fiscal policies, structural adjustment, and international competitiveness; labor market institutions, indexation, and fiscal policies; fiscal policies and exchange rate policies; the international consistency of fiscal policies and the role of coordination.

Other possible topics that can be interpreted as related to international macroeconomics will be considered. Priority will be given to empirically oriented research, but submission of theoretical papers on these topics is also welcome.

Papers will be selected on the basis of abstracts of about 500 words or, when possible, complete papers. Preference will be given to papers by younger members of the profession. Any research that will not have been published at the time of the conference may be submitted. The deadline for submission of abstracts and papers is June 21, 1985. Authors chosen to present papers will be notified by August 2. Finished papers must be ready for distribution to conference participants by October 18, 1985. The NBER will pay the expenses of those chosen to give papers at the conference. Abstracts and papers should be sent to: Professor Jacob A. Frenkel, National Bureau of Economic Research, 1050 Massachusetts Avenue, Cambridge, MA 02138.

Bureau News

Tax Economists Hold Fall Meeting

NBER's Program in Taxation, directed by David F. Bradford of Princeton University, held its fall meeting in Cambridge on October 25 and 26. The agenda, which included both formal presentations and open discussions, was:

- B. Douglas Bernheim, NBER and Stanford University, "Dissaving after Retirement: Testing the Pure Life-Cycle Hypothesis" (NBER Working Paper No. 1409)
Discussant: Jerry A. Hausman, NBER and MIT
- Reed Shuldiner, Wilmer, Cutler and Pickering, "Do Tax Shelters Save You Taxes?"
Discussant: James M. Poterba, NBER and MIT
- William Andrews and Alvin Warren, Harvard University Law School, "Time Value of Money Provisions"
Emil Sunley, Deloitte, Haskins & Sells, "Economic Performance and Premature Accruals"
Joseph E. Stiglitz, NBER and Princeton University, joint work with Jeffrey J. Leitzinger, "Information Externalities in Oil and Gas Leasing"
Michael J. Boskin, NBER and Stanford University, joint work with Marc S. Robinson, University of California, Los Angeles, Terrance O'Reilly, and Praveen Kumar, "New Estimates of the Value of Federal Mineral Rights and Land" (NBER Working Paper No. 1447)
Discussant: Daniel R. Feenberg, NBER
- Mark S. Robinson, "Oil Lease Auction: Reconciling Economic Theory with Practice"
Discussant: Paul Milgrom, Yale University
- Kenneth Judd, Northwestern University, "Short-Run Effects of Uncertainty about the Timing of Future Taxes"
Discussant: Jerry R. Green, NBER and Harvard University
- Joel Slemrod, NBER and Council of Economic Advisers, "A General Equilibrium of Taxation That Uses Microunit Data: With an Application to the Impact of Instituting a Flat-Rate Income Tax"
Discussant: Don Fullerton, NBER and University of Virginia

In his paper, Bernheim examines several aspects of saving and dissaving after retirement. First, he argues that existing evidence on age-bequeathable wealth profiles is suspect; he provides new evidence, based on longitudinal data, that significant dissaving may occur, particularly among single individuals and early

retirees. Second, he proposes that, in the presence of annuities, estimates of dissaving should be adjusted by including the simple discounted value of benefits in total wealth. Such adjustments reveal relatively little dissaving among any group of retirees. Finally, he tests the pure life-cycle hypothesis by observing the behavioral response of rates of accumulation to involuntary annuitization. Bernheim's work empirically refutes life-cycle implications.

Shuldiner notes that the volume of tax shelter activity has skyrocketed in recent years; the popular perception is that the Treasury is losing large amounts of tax revenues while individual taxpayers are avoiding substantial taxes. However, he shows that for an equipment-leasing tax shelter there are only small losses (taken at face value) to the government and little risk-adjusted windfall to the taxpayer. Nonetheless, there are opportunities to combine the tax shelter with other provisions of the tax code, such as the step-up in basis at death, in order to substantially reduce tax payments.

The first afternoon session concluded with a presentation on the "time value of money" provisions in the Deficit Reduction Act of 1984. Andrews described the new rules requiring imputation of interest: for example, on bonds with original issue discount, market discount bonds, and loans below market interest. One conclusion from the group discussion was that if income is not properly measured under an income tax, the government will lose because private parties will structure their transactions in order to best exploit this mismeasurement.

Warren and Sunley continued the discussion of the time value of money. They focused on the tax treatment of liabilities that remain unpaid for a long time: for example, the costs of reclaiming land disturbed by surface mining, costs of decommissioning nuclear plants, and payments made to settle workers' compensation claims.

Boskin's paper, discussed on the second day of the meeting, constructs a time series (1954-82) for the value of federal mineral rights in oil and natural gas by using data on reserves and federal royalties and bonus payments. By 1981, federal mineral rights were the largest item among federal government assets (dominating the value of tangible capital or financial assets) at \$819 billion. The level and changes in such asset values have important implications for various issues, from cost-benefit analysis to optimal government finance.

Robinson develops several results regarding the use of minimum prices in auctions. He shows that minimum prices frequently raise sellers' revenue and that they should fluctuate with the value of the lease to the bidder. Combined with other considerations relevant to landowners, these results suggest a structure for oil lease auctions that is quite different from that currently recommended by theory. However, the structure is consistent with the bonus bidding with fixed royalties that is observed in actual auctions.

Judd's paper asks how uncertainty about future policy on taxes and expenditures affects current invest-

ment, labor supply, and output. He finds that increasing uncertainty about the timing of future policy changes has a magnification effect. For example, an increase in future capital income taxes depresses current investment and output; uncertainty about its timing will further depress both. Judd's analysis is general equilibrium; his existence proof also provides a numerical algorithm for simulating such an economy.

In his paper, Slemrod develops a methodology for integrating the information from microunit data files into the framework of a general equilibrium model of taxation. He then applies this methodology to a study of the economic impact of instituting a flat-rate income tax system. He finds that upper-income households are made better off by such a tax, while lower-income households lose ground.

Other participants in the tax discussions were: Alan J. Auerbach, NBER and University of Pennsylvania; Andrew Berg, Louis Kaplow, Jonathan I. Leape, Lawrence B. Lindsey, and N. Gregory Mankiw, Harvard University; Martin Feldstein and Lawrence H. Summers, NBER and Harvard University; Daniel J. Frisch, NBER and U.S. Department of the Treasury; Roger Hall Gordon, NBER and University of Michigan; David G. Hartman, NBER; Albert S. Kyle and Harvey S. Rosen, NBER and Princeton University; Michael Rothschild, NBER and University of California, San Diego; and John B. Shoven, NBER and Stanford University.

Macroeconomists Meet in Stanford

Members and guests of NBER's Program in Economic Fluctuations met at NBER's California office on January 11 to discuss recent research. The day's agenda was:

Joseph E. Stiglitz, NBER and Princeton University, "Theories of Wage Rigidity" (NBER Working Paper No. 1442)

Discussant: Laurence Weiss, University of Chicago
Helmut Bester, University of Bonn, "Long-Term Wage Contracts and Dual Labor Markets"

Discussant: Costas Azariadis, University of Pennsylvania

Finn Kydland, Carnegie-Mellon University, and Edward Prescott, University of Minnesota, "The Workweek of Capital and Labor"

Discussant: N. Gregory Mankiw, MIT

Julio J. Rotemberg, NBER and MIT, and Garth Saloner, MIT, "A Supergame-Theoretic Model of Business Cycles and Price Wars during Booms" (NBER Working Paper No. 1412)

Discussant: Tim Bresnahan, Stanford University

Bennett T. McCallum, NBER and Carnegie-Mellon University, "Bank Deregulation, Accounting Systems of Exchange, and the Unit Account: A Critical Review"

Discussant: Robert E. Hall, NBER and Stanford University

Stiglitz's paper critically reviews two sets of theories that attempt to explain wage rigidities and unemployment. The first, the implicit contract theory, is based on the hypothesis that workers are more risk averse than firms. Firms have superior access to capital markets; workers have valuable firm-specific skills; and firms and workers share private information about the workers' future earnings potential. As a result, firms and workers enter into implicit contracts: the firm provides a steady stream of payments to workers in return for the right to vary the hours worked as demand for the product varies.

The efficiency wage theory, on the other hand, assumes that worker productivity is positively correlated with the wage rate. Firms do not lower wages even when unemployment is high because to do so would lower the productivity of the already-employed workers. Stiglitz argues that, while both theories can explain wage rigidity, the efficiency wage theory provides a better explanation for variations in employment.

Bester extends the standard implicit contract model by considering an economy in which some proportion of the labor force works under a long-term contract; the remainder of the workers sell their services in a spot market. Bester's model is designed to explain why workers with similar characteristics are treated differently in the labor market. In his model, there will be workers who desire a job covered by a long-term contract and who cannot obtain one. Another interesting implication of Bester's model is that aggregate output in this economy will be lower than if there were no long-term labor contracts.

Kydland and Prescott have previously constructed intriguing and influential equilibrium models of cyclical fluctuations. One difficulty with their earlier models, though, is a chronic oversensitivity of output to labor input: in the Kydland-Prescott model, an increase in labor input produces roughly one-and-a-half times the increase in output that would typically occur in the U.S. economy. In this paper, Kydland and Prescott modify their earlier models by allowing firms to increase labor input in two ways: by hiring more workers, or by increasing the length of the workday. They find that this change reduces some, but not all, of the discrepancy between the behavior of the model and the behavior of the actual economy.

The paper by Rotemberg and Saloner considers a novel link between macroeconomics and the theory of oligopolies. In their model, firms that implicitly collude find that the profitability of "cheating" against the cartel varies over the business cycle. As a result, the cartel

as a whole must lower prices and/or increase output when demand is high. Since the output of the cartelized industry is an input to other firms, the initial swing in demand may be amplified. That is, the cyclical tendencies in the economy may be reinforced. Rotemberg and Saloner examine the behavior of the railroads in the 1880s, the automobile industry in the 1950s, and the cyclical behavior of cement prices, and find evidence to support their theory.

McCallum examines several recent proposals calling for further deregulation of the monetary system. The common feature of these proposals is the relaxation of government restrictions, both explicit and implicit, on the private issue of moneylike assets. These proposals contradict the monetarist contention that a government monopoly on the issue of money is necessary for price level stability. McCallum finds that exchange systems relying on privately backed securities or accounting-based mechanisms are viable and may lead to the optimal provision of transaction services. He concludes, however, that we cannot at present predict the dynamic behavior of these types of monetary systems.

In addition to the authors and discussants, the following NBER associates attended the meeting: B. Douglas Bernheim, Ben S. Bernanke, Michael J. Boskin, Michael D. Hurd, Stephen R. King, John B. Shoven, and John B. Taylor, all of Stanford University; Robert Chirinko and Takatoshi Ito, Hoover Institution; Marjorie Flavin, University of Virginia; Robert J. Gordon, Northwestern University; John Huizinga and Edward P. Lazear, University of Chicago; and Morley Gundersen, Bronwyn H. Hall, and Dan Usher.

Also participating were: Moses Abramovitz, Antonio Borges, Joseph Greenberg, Bert G. Hickman, Jim Howell, Tomio Kinoshita, Michael Perelman, Michael Riodan, Edward Shaw, and Gavin Wright, Stanford University; Sean Beckett and Robert Clower, University of California at Los Angeles; Donald Cox, Washington University (St. Louis); Dennis Epple, Rita Ricardo-Campbell, Juergen Schroeder, and Pablo Spiller, Hoover Institution; Paul Evans, University of Houston; Alexander Field, University of Santa Clara; Gillian Garcia, U.S. General Accounting Office; Mark Gertler, University of Wisconsin; James Hamilton, University of Virginia; Walter Heller and Ross Starr, University of California at San Diego; Wayne Joerding, Thomas Mayer, and Joaquim Silvestre, University of California at Davis; Stephen Jones, University of California at Berkeley; Stephen LeRoy, University of California at Santa Barbara; and Aloysius Siow, Columbia University.

Financial Economists in Cambridge

Members and guests of NBER's Program in Financial Markets and Monetary Economics gathered at the Bureau's Cambridge office on February 21 and 22 to discuss their recent research. Program Director Benjamin M. Friedman of Harvard University organized the two-day meeting. The agenda was:

James M. Poterba NBER and MIT, and Lawrence H. Summers, NBER and Harvard University, "The Persistence of Volatility and Stock Market Fluctuations" (NBER Working Paper No. 1462)

Discussant: Robert S. Pindyck, NBER and MIT

John Huizinga, NBER and University of Chicago, and Frederic S. Mishkin, NBER and Columbia University, "The Measurement of Ex Ante Real Inflation Rates on Assets with Different Risk Characteristics"

Discussant: Robert J. Shiller, NBER and Yale University

Herschel I. Grossman, NBER and Brown University, and John B. Van Huyck, Brown University, "Seigniorage, Inflation, and Reputation" (NBER Working Paper No. 1505)

Discussant: Stanley Fischer, NBER and MIT

Albert S. Kyle, NBER and Princeton University, "Continuous Auctions and Insider Trading"

Discussant: Terry Marsh, NBER and MIT

Roger Hall Gordon, NBER and University of Michigan, and Hal R. Varian, University of Michigan, "Intergenerational Risk Sharing"

Discussant: Stewart C. Myers, NBER and MIT

In their paper, Poterba and Summers examine the potential influence of changes in the volatility of stock market returns on the level of prices in the stock market. Volatility is only weakly serially correlated, they find, implying that shocks to volatility do not persist. These shocks, therefore, can have a small impact at most on stock market prices, since changes in volatility affect expected required rates of return only for relatively short intervals. These results cause Poterba and Summers to be skeptical of recent claims that the stock market's poor performance during the 1970s can be explained by volatility-induced risk premiums.

Next, Mishkin discussed the measurement of ex ante real returns on seven different assets from 1959 to 1979. He and Huizinga observed statistically significant movements in the real returns on all of the assets except long-term government bonds. These movements were correlated with inflation, nominal interest rates, energy supply shocks, and the cyclical component of industrial production.

Despite a common downward movement of real returns from the 1960s to the 1970s, there was also a statistically significant risk premium that varied over time. The risk premiums were also correlated with inflation,

nominal interest rates, and the business cycle, but not with energy supply shocks.

Huizinga and Mishkin's results confirm previous research that found that movements in nominal interest rates on short-term government securities primarily reflected changes in expected inflation. However, as the maturity of an asset lengthens, the variation in its ex ante real return increases, and the correlation between ex ante nominal returns and expected inflation declines.

The paper by Grossman and Van Huyck derives a reputational equilibrium for inflation in a model in which the government obtains valuable seigniorage by issuing fiat money in exchange for real resources. One result is that, with contemporaneous perception of actual government behavior and immediate adjustment of real cash balances to new information, the Friedman elasticity solution for maximum seigniorage is the reputational equilibrium.

More generally, the analysis shows that the objective of maximal seigniorage produces an equilibrium inflation rate either equal to a generalization of the Friedman elasticity solution or to the rate at which the government discounts future seigniorage adjusted for the growth rate, whichever is larger. Thus, the model formalizes the conjecture that episodes of inflation with rates in excess of the Friedman solution are caused by high discount rates for future seigniorage. By adding an aversion to high expected inflation to the model, this analysis also rationalizes the observation that inflation rates are usually less than Friedman's elasticity solution.

Kyle's paper presents a dynamic model of insider trading with sequential auctions. The model is structured to resemble a sequential equilibrium, in order to examine the informational content of prices, the liquidity characteristics of a speculative market, and the value of private information to an insider. The model includes three types of traders: a single risk-neutral insider, random-noise traders, and risk-neutral competitive marketmakers. The insider makes (positive) profits by optimally exploiting his monopoly power in a dynamic context; the noise trader provides camouflage that conceals his trading from the marketmakers. As the time interval between auctions approaches zero, a limiting model of continuous trading evolves. In this equilibrium, prices follow Brownian motion, the depth of the market is constant over time, and all private information is incorporated into prices by the end of trading.

In their paper, Gordon and Varian begin with the assumption that markets may or may not spread risk adequately among living individuals, but that they certainly cannot spread risk to members of future generations: future generations are not alive to contract ex ante to bear some share of a lottery that resolves itself before they are born. Yet efficiency would require that each future generation share in a current lottery up to the point where it finds bearing more risk as costly as current generations do. While the market does not provide a mechanism for risk to be shared by future generations, the government easily can provide such a

mechanism through the use of stochastic debt or stochastic taxes. In fact, governments frequently use debt to finance the costs of unfavorable events, such as wars or depressions. The paper by Gordon and Varian explores the characteristics of a government policy that will share risk efficiently across generations.

In addition to the authors and discussants, the following NBER associates participated in the program meeting: Andrew B. Abel and Andrew Caplin, Harvard University; Olivier J. Blanchard, MIT; Zvi Bodie, Alex Kane, and Laurence J. Kotlikoff, Boston University; Willem H. Buiter and Richard H. Clarida, Yale University; R. Glenn Hubbard, Robert L. McDonald, and Daniel Siegel, Northwestern University; Takatoshi Ito, University of Minnesota; Edward J. Kane, Ohio State University; Bruce Lehman, Columbia University; Angelo Melino, University of Toronto; V. Vance Roley, University of Washington; James A. Wilcox, University of California, Berkeley; and Jess B. Yawitz, Washington University (St. Louis).

March Meeting of Tax Economists

NBER's Program in Taxation met in Cambridge on March 7 and 8 to discuss their recent research. The agenda for the two days was:

N. Gregory Mankiw and Lawrence H. Summers, NBER and Harvard University, "Are Tax Cuts Really Expansionary?" (NBER Working Paper No. 1443)

Discussant: Willem H. Buiter, NBER and Yale University

Alan J. Auerbach, NBER and University of Pennsylvania, and James Hines, Harvard University, "User Cost and Q in a Perfect Foresight Model"

Discussant: Andrew B. Abel, NBER and Harvard University

Dale Jorgenson, Harvard University, joint work with Kun-Young Yun, "Tax Policy and Capital Allocation"

Discussant: Don Fullerton, NBER and University of Virginia

Angus Deaton, NBER and Princeton University, "Econometric Issues for Tax Design in Developing Countries"

Discussant: Jerry A. Hausman, NBER and MIT

Lawrence B. Lindsey, Harvard University, "Rate Reductions and Revenue Response: Evidence from 1982"

Discussant: Daniel Feenberg, NBER and Princeton University

Sweder van Wijnbergen, The World Bank, joint work with Christopher Doyle, "Taxation of Foreign Multinationals: A Sequential Bargaining Approach to Tax Holidays"

Discussant: Albert Kyle, NBER and Princeton University

Michael J. Boskin, NBER and Stanford University, and Laurence J. Kotlikoff, NBER and Boston University, "Public Debt and U.S. Savings: A New Test of the Neutrality Hypothesis"

Discussant: James M. Poterba, NBER and MIT

Roger Hall Gordon, NBER and University of Michigan, and Hal R. Varian, "Intergenerational Risk-Sharing"

Discussant: Jerry R. Green, NBER and Harvard University

Mankiw and Summers (whose paper is summarized in *NBER Digest*, February 1985) suggest that under certain circumstances tax cuts can actually be contractionary. If the form of the tax cut tilts GNP toward consumer spending and away from investment spending, they suggest, then the demand for money will increase. If the money supply is fixed, interest rates already pushed up by potentially higher deficits will rise even further. The tax cut, through higher interest rates, could thus be contractionary.

Auerbach and Hines analyze the effects of changes in the tax law on corporate investment and firm valuation in the United States. Their study compares the effects of different degrees of investor foresight about future changes in the tax law. They find that investment and firm valuation can be sharply affected (in the short term) by future tax provisions and by the presence or absence of adjustment costs. Analyzing U.S. corporate investment from 1953 to the present, Auerbach and Hines conclude that (given adjustment costs, investor foresight, and the frequency of changes in the tax law) investment and valuation behavior may be explained better by a forward-looking model than by one that assumes that investors are myopic.

The paper by Jorgenson and Yun analyzes the impact of U.S. tax policy on the efficiency of capital allocation. For this purpose, they employ an intertemporal general equilibrium model of the U.S. economy. This model is implemented econometrically for annual data on the United States covering 1955-80. They find that replacement of taxes on the income from capital by a consumption tax would produce dramatic gains in social welfare in the United States.

Deaton's paper discusses the actual and potential contribution of econometric analysis to the design of optimal tax systems and tax reform programs in developing countries. Under several sets of assumptions, optimal tax rates and tax improvement rules are *independent* of the parameters of the model; estimation has no impact once the functional form has been selected. Deaton also argues that calculated tax rules are not robust to changes in specification that would be very difficult to detect empirically. It is therefore unclear whether modern tax reform and optimal tax theory may be implemented given the current and likely future availability of data.

As background to his work, Lindsey notes that the tax cut enacted in 1981 provided a real world test of the

relationship between tax rates and tax revenues. His paper compares actual taxable income and tax revenues with those predicted by a baseline income distribution based on the macroeconomic environment of 1982 and the historic relationships between personal income components and taxable income. Lindsey finds that in the aggregate the rate reduction did lead to a decrease in revenue. However, about 45 percent of the revenue loss that was anticipated in 1982 was recouped because taxpayers changed their behavior in reaction to the new rates. Moreover, among taxpayers in the top brackets, generally those enjoying a rate reduction from 70 percent to 50 percent, revenue actually increased. The paper also estimates that the top marginal rate for maximizing revenue is 45 percent.

In their paper, Doyle and van Wijnbergen consider the tax holiday, or limited period of time during which a multinational enterprise (MNE) receives tax concessions. They view the tax schedule applied to the MNE's profits as the outcome of a sequential bargaining process. They then use the concept of perfect equilibrium solution from game theory to show that tax holidays will emerge from such a bargaining process if the MNE incurs fixed costs upon entry. The tax rate that emerges from bargaining has a dynamic structure: the host country gradually obtains higher and higher tax rates until an upper limit is reached. After that, the tax rate remains constant. The tax schedule thus includes a tax holiday; this is the only way compatible with incentives that the MNE can recover fixed costs.

In their paper, Boskin and Kotlikoff examine Barro's infinite-horizon, intergenerationally altruistic model. A distinguishing feature of this model is that aggregate consumption depends only on collective resources and not on the age distribution of resources. To test this proposition, they specify the Barro model with earnings and rates of return uncertain. They ask whether, given the level of consumption predicted by this model, variables measuring the age distribution of resources influence actual consumption. Data on the age distribution of resources come primarily from the annual Current Population Surveys. The preliminary results imply a rejection of the hypothesis that aggregate consumption is independent of the age distribution of resources. The contention that government debt policy does not affect consumption and savings is therefore doubtful.

(The paper by Gordon and Varian is described earlier in this issue in "Financial Economists Meet in Cambridge.")

Other NBER associates attending the tax meeting included: Program Director David F. Bradford, Harvey S. Rosen, and Joseph E. Stiglitz, Princeton University; Charles T. Clotfelter, Duke University; NBER President Martin Feldstein, and Louis Kaplow, Harvard University; Daniel J. Frisch, U.S. Department of the Treasury; David G. Hartman, Data Resources, Inc.; Patric H. Hendershott, Ohio State University; Peter M. Mieszkowski, Rice University; Jonathan S. Skinner, University of Virginia; and Geoffrey Carliner, NBER. Also participating were: William Andrews, Andrew Berg, and

Jonathan I. Leape, Harvard University; Hugh Ault and Paul McDaniel, Boston College; Daniel M. Holland, MIT; David M. Newbery, Princeton University; and Joel Slemrod, Council of Economic Advisers.

Reprints Available

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555. "Exchange Rate Dynamics with Sluggish Prices under Alternative Price-Adjustment Rules," by Maurice Obstfeld and Kenneth Rogoff, 1984 (NBER Working Paper No. 1173)
556. "On Low-Frequency Estimates of Long-Run Relationships in Macroeconomics," by Bennett T. McCallum, 1984 (NBER Working Paper No. 1162)
557. "Optimal Bond Trading with Personal Taxes," by George M. Constantinides and Jonathan E. Ingersoll, Jr., 1984 (NBER Working Paper No. 1184)
558. "Foreign Production and Exports of Individual Firms," by Robert E. Lipsey and Merle Yahr Weiss, 1984 (NBER Working Paper Nos. 87 and 131)
559. "The Accuracy of Individual and Group Forecasts from Business Outlook Surveys," by Victor Zarnowitz, 1984 (NBER Working Paper No. 1053)
560. "Informational Imperfections in the Capital Market and Macroeconomic Fluctuations," by Bruce Greenwald, Joseph E. Stiglitz, and Andrew Weiss, 1984 (NBER Working Paper No. 1335)
561. "Prices and Terms of Trade for Developed-Country Exports of Manufactured Goods," by Irving B. Kravis and Robert E. Lipsey, 1984 (NBER Working Paper No. 774)
562. "Moving and Housing Expenditure: Transaction Costs and Disequilibrium," by Steven F. Venti and David A. Wise, 1984 (NBER Working Paper No. 1012)
563. "Prospective Changes in Tax Law and the Value of Depreciable Real Estate," by Patric H. Hendershott and David C. Ling, 1984 (NBER Working Paper No. 1352)

564. "Compensating Wage Differentials for Mandatory Overtime?" by Ronald G. Ehrenberg and Paul L. Schumann, 1984 (NBER Working Paper No. 805)
565. "Recent Trends in U.S. Trade and Investment," by Robert E. Lipsey, 1984 (NBER Working Paper No. 1009)
566. "The Effect of Social Security on Retirement in the Early 1970s," by Michael D. Hurd and Michael J. Boskin, 1984 (NBER Working Paper No. 659)
567. "International Interest Rate and Price Level Linkages under Flexible Exchange Rates: A Review of Recent Evidence," by Robert E. Cumby and Maurice Obstfeld, 1984 (NBER Working Paper No. 921)
568. "Uncertainty, Welfare Cost, and the 'Adaptability' of U.S. Corporate Taxes," by Don Fullerton, Andrew B. Lyon, and Richard J. Rosen, 1984 (NBER Working Paper No. 1239)
569. "U.S. Antidumping Policies: The Case of Steel," by Barry J. Eichengreen and Hans van der Ven, 1984 (NBER Working Paper No. 1098)
570. "The Short-Run Demand for Money: A Reconsideration," by Robert J. Gordon, 1984 (NBER Working Paper No. 1421)
571. "Cost Implications of Hospital Unionization: A Behavioral Analysis," by David S. Salkever, 1984 (NBER Working Paper No. 946)
572. "Stabilization Policies in Open Economies," by Richard C. Marston, 1985 (NBER Working Paper No. 1117)
573. "International Competition and the Unionized Sector," by Gene M. Grossman, 1984 (NBER Working Paper No. 899)

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The following studies in the NBER Technical Working Papers series are now available (see previous issues of the *NBER Reporter* for other titles). Like NBER Working Papers, these studies may be obtained by sending \$2.00 per paper to: Technical Working Papers, National Bureau of Economic Research, 1050 Massachusetts Avenue, Cambridge, MA 02138. Prepayment is required for all orders under \$10.00.

43. "Error Components in Grouped Data: Why It's Never Worth Weighting," by William T. Dickens, February 1985 (JEL No. 211)
44. "Asset Pricing Theories," by Michael Rothschild, March 1985 (JEL No. 313)
45. "Testing the Random Walk Hypothesis: Power versus Frequency of Observation." by Robert J. Shiller and Pierre Perron, April 1985 (JEL Nos. 313, 211)

Bureau Books

Cambridge Press Publishes Bureau Volume

International Economic Policy Coordination, edited by NBER Research Associates Willem H. Buiter and Richard C. Marston, is now available from Cambridge University Press at a cost of \$44.50. This volume is based on a conference sponsored jointly by NBER and the Centre for Economic Policy Research (London).

In recent years, there has been a revival of interest in the international coordination of economic policy. However, the recent economic literature offers little on this subject. The papers in this volume focus on several important reasons for coordinating international policy: the transmission effects of one country's policies on another country; the trade-off between current and future effects and policies; and the credibility of government policy taken unilaterally or coordinated internationally.

The conference brought together leading economists in this field, including NBER Research Associates William H. Branson, Jacob A. Frenkel, and Jeffrey D. Sachs. The resulting volume should interest both academic and government economists, international policymakers, and advanced students of economics.

This volume may be ordered from: Cambridge University Press, Customer Service Department, 510 North Avenue, New Rochelle, NY 10801. From New York State or Canada, phone (914) 235-0300; from all other states, dial 1-800-431-1580.

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

New Work on Corporate Capital Structures

Corporate Capital Structures in the United States, edited by Benjamin M. Friedman, is available from the University of Chicago Press at a cost of \$48.00.

This NBER conference volume focuses on the financial side of capital formation. Among the questions addressed are: What is the recent pattern of corporate debt and equity financing? Is this pattern historically unusual? Are the firm's investment decisions fundamentally related to its financing decisions. How does the market price the firm's debt and equity securities? How does this pricing mechanism affect the firm's decisions?

With capital formation still at the forefront of economic and policy discussions, this work represents an important contribution to our body of economic knowledge. Its editor, Friedman, is director of NBER's Program in Financial Markets and Monetary Economics and a professor of economics at Harvard University.

Volume on Social Experimentation Published

Social Experimentation, edited by David A. Wise and Jerry A. Hausman, is now available from the University of Chicago Press at a cost of \$33.00.

Social experiments, in the economic sense, are test projects conducted with a large number of people and designed to help measure behavioral responses to various policies. One example of a social experiment might be an income maintenance program conducted in a single city. In the 1970s, social experimentation took place on a large scale in the United States; naturally, it was quite costly. We can now look back and ask whether the findings of these experiments, as opposed to more conventional economic research, justified their cost.

To that end, NBER brought together a number of experts in the field at a conference held in 1981. *Social Experimentation* contains the papers presented at that conference and the formal discussions and comments on them. It should be a valuable reference for those whose work involves evaluation of policy and for academic researchers.

Hausman and Wise are research associates in NBER's Program in Labor Studies. Hausman is an economics professor at MIT; Wise is a professor at Harvard's John F. Kennedy School of Government.

Current Working Papers

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Journal of Economic Literature (JEL) subject codes, when available, are listed after the date of the Working Paper. Abstracts of all Working Papers issued since September 1984 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.

Workers' Compensation, Wages, and the Risk of Injury

Ronald G. Ehrenberg
Working Paper No. 1538
January 1985
JEL No. 820

This paper analyzes the effects of the Workers' Compensation (WC) system on wages and work injury experience. It stresses how lessons learned from other forms of social insurance can be applied to research on WC.

I begin with a brief overview of the characteristics of the WC system. Next, I sketch some simple labor market models that provide implications about how the system might affect employee compensation and the frequency and duration of both work injuries and reported WC claims. The bulk of the paper critically analyzes the relevant empirical literature, summarizing what we have learned from it and suggesting future research directions.

Academic Ability, Earnings, and the Decision to Become a Teacher: Evidence from the National Longitudinal Study of the High School Class of 1972

Charles F. Manski

Working Paper No. 1539

January 1985

JEL Nos. 812, 912

Perceived shortcomings in the quality of American education at the elementary and secondary school levels have drawn much public attention recently. In particular, concern with the composition of the teacher force has been prominent. Informed assessment of the various proposals for increasing the quality of the teaching force is possible only if we can forecast the extent to which these proposals, if enacted, would influence the decisions about occupational choice of young adults with high ability. Until now, there has been no basis for making such forecasts.

The research reported in this paper, through analysis of data from a national sample of college graduates, examines the relationships between academic ability, earnings, and the decision to become a teacher. The data reveal that the frequency of choice of teaching as an occupation is inversely related to academic ability. Conditioning on sex and academic ability, the earnings of teachers are much lower, on average, than those of other working college graduates. Conditioning on sex, the earnings of teachers tend to rise only slightly, if at all, with academic ability.

An econometric analysis suggests that in the absence of a minimum ability standard, increases in teacher earnings would yield substantial growth in the size of the teaching force but minimal improvement in the average academic ability of teachers. If teacher salaries are not increased, instituting a minimum ability standard would improve the average ability of the teaching force but would reduce its size. The average ability of the teaching force can be improved and the size of the teaching force maintained if minimum ability standards are combined with sufficient salary increases. It appears that the average academic ability of teachers can be raised to the average of all college graduates if a minimum SAT score (verbal + math) of 800 is required for teacher certification and teacher salaries are raised by about 10 percent over their present levels.

Determinants of Slave and Crew Mortality in the Atlantic Slave Trade

Richard H. Steckel and Richard A. Jensen

Working Paper No. 1540

January 1985

JEL No. 040

This paper measures and analyzes death rates that

prevailed in the Atlantic slave trade during the late 1700s. Crew members died primarily from fevers (probably malaria) and slaves died primarily from gastrointestinal diseases. Annual death rates in this activity were 230 per 1000 among the crew and 83 per 1000 among slaves. The lack of immunities to the African disease environment contributed to the high death rates among the crew. The spread of dysentery among slaves during the voyage was probably exacerbated by congestion and poor nutrition. Death rates differed systematically by region of origin in Africa and season of the year. There was little interaction between the incidence of slave deaths and crew deaths. The high death rates make the slave trade a demographic laboratory for study of health and mortality and an economic laboratory for study of markets for free labor.

The U.S. Capital Stock in the Nineteenth Century

Robert E. Gallman

Working Paper No. 1541

January 1985

JEL Nos. 040, 220

This paper describes a set of seven capital stock estimates for the United States, distributed at decennial intervals from 1840 through 1900. The estimates link with Raymond Goldsmith's work on the twentieth century to form a capital stock series covering well over 100 years of U.S. history. The paper describes the theoretical underpinnings of the new estimates, the sources of the evidence from which they were constructed, the types of estimating procedures followed, and the relationships of the new series to other economic aggregates. It also considers a few of the ways in which the series illuminates the nature of the nineteenth-century U.S. economy and the course of U.S. economic development.

Efficient Inflation Forecasts: An International Comparison

Alex Kane and Leonard Rosenthal

Working Paper No. 1542

January 1985

JEL No. 521

This paper asks whether nominal Eurocurrency interest rates convey significant information about expected inflation. First, we generate two sets of inflation forecasts, for the United States and five European countries: (1) from time series of past inflation rates; and (2) by forecasting real rates from time series of past real rates and subtracting these forecasts from nominal

rates. Then we compare the accuracy of the two sets of forecasts. The results indicate that nominal Eurocurrency rates provide valuable marginal information about expected inflation for the United States and United Kingdom, but not for the other European countries.

Short-Term Movements of Long-Term Real Interest Rates: Evidence from the U.K. Indexed Bond Market

James A. Wilcox
Working Paper No. 1543
January 1985
JEL No. 310

The central government in the United Kingdom now issues both nominal and inflation-indexed, long-term bonds. The difference in their yields provides one measure of the long-term expected rate of inflation. The evidence suggests that higher long-term, expected, real yields are associated with forecasts of higher income, tighter monetary policy, and positive aggregate supply shocks. Changes in the short-term growth rate of the monetary base, which presumably capture the so-called liquidity effect on short-term interest rates, do not perceptibly alter long-term real rates. Long-term real rates also appear to be unaffected by the rate of expected inflation. Comparison with estimates from nominal interest rate equations reveals that conclusions about the effect of all variables are extremely sensitive to the choice of a proxy for expected long-term inflation.

Taxable and Tax-Exempt Interest Rates: The Role of Personal and Corporate Tax Rates

Joe Peek and James A. Wilcox
Working Paper No. 1544
January 1985

This paper investigates empirically the effects of personal and corporate taxes on taxable interest rates and on the spread between taxable and tax-exempt rates. Two main sets of results emerge. First, we establish that the effective marginal investors in the Treasury bill market are households, not tax-exempt institutions or corporations. We find no evidence of effects of the corporate tax rate on Treasury bill yields.

We then study the tax-exempt market. The results there contradict the hypothesis that commercial bank arbitrage generally ensures that the interest rate spread between taxable and tax-exempt bonds is determined by the corporate tax rate. Our estimates decisively reject the corporate over the personal income tax rate as the relevant tax rate of the marginal investor in this market as well.

Portfolio Choice and the Debt-to-Income Relationship

Benjamin M. Friedman
Working Paper No. 1545
January 1985
JEL No. 313

The ratio of outstanding debt to gross national product in the United States has shown essentially no time trend over a period measured in decades, not in years. The research reported in this paper indicates that the portfolio behavior of lenders exhibits the characteristics that could plausibly explain this phenomenon.

Given the long-run stability of the U.S. economy's wealth in relation to income, the question of lenders' behavior as an explanation of the stable aggregate debt-to-income ratio turns on whether investors treat debt and other assets as close or distant substitutes in their portfolios. Analysis of the respective risk properties of financial assets indicates that debt and equity indeed are sufficiently distant substitutes for lenders' behavior to confine the debt-to-income ratio within relatively narrow limits. In particular, the substitutability of debt and equity securities is sufficiently limited that very large movements in expected return differentials—movements so large as presumably to elicit offsetting responses from borrowers—would be required to induce major changes in the debt share of investors' aggregate portfolio and hence in the economy's aggregate debt-to-income ratio.

Trade Restrictions as Facilitating Practices

Kala Krishna
Working Paper No. 1546
January 1985
JEL No. 422

This paper deals with the effect of trade restrictions on competition in oligopolistic markets. Quantitative restrictions, such as Voluntary Export Restrictions (VERs), are shown to affect the extent to which foreign firms can compete in the domestic market and hence to raise the equilibrium prices and profits of *both* domestic and foreign firms—when such restrictions are not too severe. This increase in prices and profits is shown to make it unlikely for VERs to raise national welfare. In addition, I show that domestic output may fall as a result of the VERs. For these reasons, VERs do not seem to be desirable ways of restricting imports.

This paper shows tariffs and quotas to be nonequivalent in such oligopoly models. A comparison of the effects of tariffs and quotas shows that it would be in the interest of domestic manufacturers to lobby for VERs instead of import-equivalent tariffs. In addition, I

show that the foreign firm would prefer VERs to import-equivalent tariffs, even if tariff revenues were refunded to them. Thus, the recent VERs on Japanese automobiles may well have been in the interests of both Japanese and American firms, and at the expense of the nation as a whole.

Productivity, R and D, and Basic Research at the Firm Level in the 1970s

Zvi Griliches

Working Paper No. 1547

January 1985

JEL No. 621

This paper analyzes a new data set (the NSF-Census match) containing information on the R and D expenditures, sales, employment, and other details for approximately 1000 of the largest manufacturing firms in the United States during 1957-77. It uses a standard production function framework augmented by the addition of R and D "capital" and "mix" variables ("basic" as a fraction of total, and privately financed as a fraction of total). The results indicate that R and D continued to contribute to productivity growth in U.S. manufacturing in the 1970s, with no significant decline in its effectiveness as compared to the 1960s. Also, the contribution of the basic research component of R and D expenditures was significantly higher than its nominal ratio would imply. Finally, while federally financed R and D expenditures did have a positive effect on measured productivity growth of these firms, this effect was significantly smaller than the comparable contribution of privately financed R and D expenditures.

Pricing Adjustable-Rate Mortgages

Patric H. Hendershott

Working Paper No. 1548

January 1985

JEL No. 313

This paper provides a framework for pricing adjustable-rate mortgages. It also summarizes evidence on the prices (that is, additions to the coupon rate) necessary to cover expected losses from the binding of various interest rate caps and from mortgage default and foreclosure. The paper shows both interest rate and default risk to be heavily influenced by the form of the mortgage instrument as well as by the underlying drift and uncertainty in interest rates and house prices.

Dynamic Behavior of Capital Accumulation in a Cash-in-Advance Model

Andrew B. Abel

Working Paper No. 1549

January 1985

JEL No. 311

This paper analyzes the dynamic behavior of capital accumulation in Stockman's (1981) cash-in-advance model. If the cash-in-advance constraint applies only to consumption, then money is superneutral along the transition path as well as in the long run. Alternatively, if the cash-in-advance constraint applies to gross investment as well as consumption, then a permanent increase in the rate of monetary growth reduces the steady-state capital stock. The effect on the speed of adjustment depends on the sign of a certain simple function of the parameters of preference and technology.

On the Optimal Taxation of Capital Income in an Open Economy

David G. Hartman

Working Paper No. 1550

January 1985

This paper examines the optimal taxation of income of foreign and domestic investors using a simple overlapping-generations model. Even when tax rates are allowed to discriminate between these groups, the optimal tax rates on incomes of both domestic and foreign investors are identical in the small open economy. They are also equal to the optimal rate of tax in the closed economy. In light of the emphasis in the literature on the extent to which the elasticity of international flows might lower optimal capital income taxes, this conclusion is quite a surprise.

In the large open economy, the optimal tax rate on the income of foreign investors alone is a weighted average of one and the small economy's tax rate. The optimal tax rate on domestic income is also unaffected by the openness of the economy.

When a large open economy must set a uniform tax rate, the rate is generally *higher* than the optimal tax rate for a closed economy. This conclusion is contrary to the conventional wisdom. A higher elasticity of international capital flows is associated with a lower tax rate, as expected. However, the rate remains above the closed-economy rate.

In summary, openness matters for optimal tax policy, primarily in the case of the large economy. The main reason for this finding is the ability to burden foreign investors with a tax liability.

The Welfare Effects of a Capital Income Tax in an Open Economy

David G. Hartman

Working Paper No. 1551
January 1985

International capital mobility typically has been ignored in discussions of the welfare effects of the capital income tax. In the rare analysis that does consider the open economy, it is recognized that highly elastic capital flows could significantly alter the usual conditions.

While there have been strenuous debates about the elasticity of international capital flows, there can be little disagreement that international ownership of capital is an important and growing phenomenon. In this paper, I explore the welfare effects of changes in the capital income tax from a different perspective: that of a country in which foreign ownership of a portion of the capital stock and foreign owners' payment of taxes is a reality.

With this modification in emphasis, a simple graphical analysis is sufficient to indicate that international capital ownership could easily dominate other welfare effects of tax changes. At least, the arguments presented in this paper raise a caution about ignoring the openness of the economy simply because elasticities are believed to be small.

Monopolistic Competition and Deviations from PPP

Joshua Aizenman

Working Paper No. 1552
January 1985
JEL No. 430

This paper explains deviations from Purchasing Power Parity (PPP) in an economy characterized by a monopolistic competitive market structure in which pricing decisions incur costs. The paper derives an optimal pricing rule, including the optimal presetting horizon. A rational expectation equilibrium, characterized by a staggered, unsynchronized price setting, is assumed; the degree of staggering is endogenously determined. The paper then focuses on the critical role of the degree of substitutability between domestic and foreign goods in explaining observable deviations from PPP.

Valuing the Government's Tax Claim on Risky Corporate Assets

Saman Majd and Stewart C. Myers

Working Paper No. 1553
February 1985
JEL Nos. 323, 521

This paper explains the effects of tax asymmetries on the value of risky capital investments made by corporations. It shows the government's claim on the firm to equal a portfolio of options on the firm's revenues. We introduce provisions of the tax law for carrying losses forward and backward, making it necessary to solve numerically for the value of the government's claim. The results show that asymmetric taxation of operating gains and losses can significantly affect the aftertax net present value of corporate investment opportunities.

Labor and Investment Demand at the Firm Level: A Comparison of French, German, and U.S. Manufacturing, 1970-79

Jacques Mairesse and Brigitte Dormont

Working Paper No. 1554
February 1985
JEL Nos. 631, 824, 229, 123

We investigate how the demand for labor and investment at the firm level (gross, net, and replacement investment, separately) differs in French, German, and U.S. manufacturing, and how it has changed since the 1974-75 recession. We use three consistent samples of panel data for large firms in 1970-79 and rely on accelerator-profits type models. We find that the accelerator effects and the profits effects did not vary much between 1970-73 and 1976-79 and were quite comparable in the three countries. The accelerator effects were more permanent, the profit effects more transitory. To a large extent, these effects account for the important changes and differences in labor and investment demand between the two subperiods and across the three countries.

Why Productivity in the Construction Industry Is Declining

Steven G. Allen

Working Paper No. 1555
February 1985

According to unpublished data compiled by the Bureau of Labor Statistics, productivity in the construc-

tion industry reached a peak in 1968 and, except for a brief and small upturn between 1974 and 1976, has been falling ever since. This paper examines the sources of this productivity decline between 1968 and 1978. I estimate a production function to assign weights to various factors responsible for productivity change. I also derive a new price deflator for construction that does not rely on indexes of labor or material cost, thus eliminating a systematic bias toward overstating the rate of growth of prices.

The production function analysis indicates that productivity should have declined by 8.8 percent between 1968 and 1978, representing 41 percent of the observed decline. The biggest factor in this decline was the reduction in skilled labor intensity resulting from a shift in the mix of output from large-scale commercial, industrial, and institutional projects to single-family houses. Other important factors include declines in the average number of employees per establishment, capital-labor ratio, percentage of unionized employees, and the average age of workers. The difference between the official deflator and the new deflator proposed here accounts for an additional 51 percent of the reported productivity decline, leaving only 8 percent of the decline unexplained.

Monetary versus Fiscal Policy Effects: A Review of the Debate

Bennett T. McCallum
Working Paper No. 1556
February 1985
JEL Nos. 310, 130, 023

This paper reviews empirical findings, econometric issues, and theoretical results bearing upon the "monetary versus fiscal policy" debate that began with the 1963 Friedman-Meiselman study. The main substantive conclusions are not very dramatic. The clearest is that an open-market increase in the money stock has a stimulative effect on aggregate demand. This conclusion in turn implies that an increase in government expenditures financed by money (or by a reduction in taxes) is more stimulative than an increase financed by bonds. This is based on empirical results obtained from St. Louis-type estimates and large-scale econometric models; it is supported by theoretical analysis involving both Ricardian and non-Ricardian assumptions.

In the case of pure fiscal policy actions—that is, bond-financed tax cuts or bond-financed expenditure increases—theory suggests that the latter should be at least as stimulative as the former, if not more so. My evidence is mixed but not obviously inconsistent with this prediction.

With respect to the textbook issue of the relative effects of pure monetary and fiscal actions, the evidence seems to support the notion that a sequence of \$*k* open-market purchases, one per period, will be much more stimulative than a single but unreversed \$*k*/period bond-financed increase in expenditures. The importance of this last issue is debatable.

The Competitive Position of U.S. Manufacturing Firms

Robert E. Lipsey and Irving B. Kravis
Working Paper No. 1557
February 1985
JEL No. 441

This paper distinguishes between the competitive position of U.S. firms and the competitive position of the United States and other countries as geographical locations for production. While the U.S. share of world exports of manufactures fell more than 40 percent between 1957 and 1977, the share of all U.S. firms from all locations declined much less, and the share of U.S. multinational enterprises increased.

The comparative advantage of U.S. multinational firms, as measured by the industry distribution of their exports from all locations, changed very little between 1966 and 1977. At the same time, there were large shifts in the comparative advantage of the parent firms in the United States, their overseas affiliates, and foreign firms. The changes for the U.S. parents and their affiliates reflected differences among industries in the extent to which export production shares moved from the United States to the affiliates' host countries. The shift took place in all the industry groups but was largest for metals and chemicals and smallest for transport equipment.

The rise in the share of world exports accounted for by U.S. multinational firms and the decline in the share of the United States as a geographical location suggests that the search for causes of the changed U.S. position should be directed not to deficiencies in American industrial or technological leadership but to other price- and cost-determining influences, such as productivity, wage setting, taxation, domestic inflation, and exchange rates.

Unemployment Rate Dynamics and Persistent Unemployment under Rational Expectations

**Michael R. Darby, John C. Haltiwanger,
and Mark W. Plant**

Working Paper No. 1558

February 1985

JEL No. 130

This paper develops a model of the dynamics of the unemployment rate that provides an explanation of persistent cyclical unemployment without assuming persistent expectational errors or other nonoptimizing behavior. Our results are based on the interaction of search dynamics and inventory adjustments. An important element in these dynamics appears to be heterogeneity in the labor force; this can be characterized as a relatively small group of individuals with high turnover comprising the bulk of normal unemployment and a larger group of individuals with low turnover who dominate movements in cyclical unemployment. Our empirical results provide support for this theory. We demonstrate that the appropriately measured probability of becoming employed during a recovery falls relative to normal because of the unusually high proportion of individuals with low turnover who have lost "permanent" jobs. As a result, recovery is much slower than is indicated by normal relationships, although each individual is searching optimally.

The Usefulness of the Wind-Up Measure of Pension Liabilities: A Labor Market Perspective

James E. Pesando

Working Paper No. 1559

February 1985

JEL Nos. 521, 820

Financial economists have long favored the use of a wind-up measure of the firm's pension liabilities. Yet the pension liabilities of the firm also represent the pension wealth of its workers. It is reasonable to presume that workers and shareholders have a common view of the pension contract. If the wind-up measure depicts the true pension liabilities of the firm, then the wage concession granted by its workers must reflect the fact that the firm may choose to terminate the plan at any time. Data on the wage-service characteristics of the membership of a sample of final earnings plans in Canada suggest, contrary to the implications of the

wind-up measure, that workers' wages do not internalize accruing pension benefits on a year-to-year basis. Instead, the data suggest that pension plans may be a vehicle through which a significant portion of the total compensation of individual employees is deferred until their later work years, and that the wind-up measure may well understate the pension liabilities of an ongoing firm.

Monitoring Costs and Occupational Segregation by Sex: A Historical Analysis

Claudia Goldin

Working Paper No. 1560

February 1985

JEL Nos. 820, 040

This paper explores supervisory and monitoring costs in order to understand aspects of occupational segregation by sex. Around the turn of this century, 47 percent of all female manufacturing operatives were paid by the piece, but only 13 percent of the males were. There were very few males and females employed by the same firm in the same occupation; when they were, they were invariably paid by the piece. The group of industries that hired two-thirds of all male operatives hired virtually no females. Males, but not females, were employed in teams across various jobs requiring similar training and ability. Occupations in the clerical sector were rapidly "feminized" from 1900 to 1920 and an organization of work was employed resembling that used earlier in manufacturing. These findings can be understood by considering a model of occupational segregation in which monitoring is costly and females have different turnover rates.

Employers adopt one of two solutions to avoid shirking—piece rates or deferred payment. Because females are employed in only one period, piece rates are used for them; males, however, might prefer deferred payment that causes their earnings profile to be steeper than otherwise. Occupational segregation by sex results even if workers are homogeneous with regard to ability and there are no costs of job investment. Males also can receive higher average wages per period than females. Under a reasonable set of assumptions, females would want to be employed in the male sector but would be barred from doing so.

I examine establishment-level and more aggregated data for manufacturing around 1890 with regard to the costs of supervising and monitoring male and female workers in time- and piece-rate positions. The findings tend to support the assumptions of the model concerning the relative costs of monitoring workers of different sexes paid by different methods.

Productivity Measurement with Nonstatic Expectations and Varying Capacity Utilization: An Integrated Approach

Catherine J. Morrison
Working Paper No. 1561
February 1985
JEL Nos. 620, 640

Typically, measures of multifactor productivity growth have been based on a production and optimization framework that assumes that all inputs are instantaneously adjustable. This ignores the important impacts of fixity of certain inputs in the short run. This paper focuses on the distinction between short and long-run production behavior represented by economic capacity utilization indexes and on the adjustment of observed productivity measures for the effects of short-run fixity characterized by these indexes. I develop a dynamic optimization model based on adjustment costs for quasi-fixed inputs in order to calculate capacity utilization adjustments for productivity growth measures. I then use the resulting framework to identify empirically the effects on productivity growth in the U.S. manufacturing sector from 1974-79 of capacity utilization, nonstatic expectations, nonconstant returns to scale, and adjustment costs for both capital and labor.

Education, Welfare, and the "New Federalism": State Budgeting in a Federalist Public Economy

Steven G. Craig and Robert P. Inman
Working Paper No. 1562
February 1985
JEL No. 325

President Reagan's proposal for a "New Federalism" raises a fundamental challenge to our current structure of federal-state-local fiscal relations. This research examines the likely consequences of the New Federalism for fiscal allocations by state governments and attempts to model the impact on both the size of state budgets and on the sectors on which that budget is spent. We specify and estimate a political economy model of state budgeting for a sample of 44 states for 1966-80. The analysis focuses on the two most visible sectors of state government expenditure—welfare and education—while accounting for the remaining end uses of state funds, other expenditures, and taxes. Two general conclusions emerge from the analysis. First, current fiscal allocations by states are significantly influenced by the structure of federal aid; without federal matching rules and spending requirements,

states would choose to spend less on education and welfare services and more on tax relief and the numerous other state activities. Second, the New Federalism, as it relaxes the spending rules and reduces the level of federal aid, both reduces state education and welfare spending and decreases the aggregate level of state expenditure. We conclude that the New Federalism will succeed in reaching its objectives; the government sector will be more decentralized, with the additional consequence of reduced government budgets.

Inventories, Stock-Outs, and Production Smoothing

Andrew B. Abel
Working Paper No. 1563
February 1985
JEL No. 022

If stock-outs are ignored and demand shocks are additive, then optimal behavior requires that the marginal cost of production (MC) be equated with the expected marginal revenue of increasing expected sales by one unit (EMR). However, with more general demand shocks (still ignoring stock-outs); the excess of MC over EMR has the same sign as the covariance of the slope of the demand curve and the marginal valuation of inventory. The equality of EMR and MC is also broken by taking account of stock-outs, even if demand shocks are additive.

If there is a production lag, then taking account of stock-outs implies that optimal behavior will be characterized by production smoothing even if the cost of production is linear. I present two alternative definitions of production smoothing, and optimal behavior in the presence of stock-outs displays each type of smoothing.

Adjusting Output and Productivity Indexes for Changes in the Terms of Trade

W. Erwin Diewert and Catherine J. Morrison
Working Paper No. 1564
February 1985
JEL Nos. 620, 430

In this paper, we employ index number theory to address the problem of adjusting real national income and real domestic product for changes in a country's terms of trade. More specifically, using recent developments in the theory of production, we address the problems related to measuring: (1) real output produced

and real input utilized by the private business sector; (2) productivity growth or technical change; (3) the effects on domestic real output of changes in the terms of trade; and (4) the impact on final sales to domestic purchasers of changes in the balance of payments deficit, in a consistent accounting framework.

This treatment of international trade allows us to undertake comparative statics analyses using only production theory; in the traditional paradigm, which treats traded goods as perfectly substitutable with a class of domestic goods, a general equilibrium framework is required. We illustrate our suggested solutions using U.S. data for 1968–82.

Crowding Out or Crowding In? Evidence on Debt–Equity Substitutability

Benjamin M. Friedman
Working Paper No. 1565
February 1985
JEL No. 311

When the composition of assets outstanding in the market changes, the pattern of expected asset returns also changes, shifting to whatever return structure will induce investors to hold just the new composition of existing assets. The object of this paper is to determine—on the basis of the respective risks associated with the returns to broad classes of financial assets in the United States, and hence on the basis of the implied portfolio substitutabilities among these assets—how government deficit financing affects the structure of market-clearing expected returns on debt and equity securities traded in U.S. markets.

The empirical results indicate that government deficit financing raises expected debt returns relative to expected equity returns, regardless of the maturity of the government's financing. More specifically, financing a single \$100 billion government deficit by issuing short-term debt lowers the expected return on long-term debt by 0.06 percent, and lowers the expected return on equity by 0.33 percent, relative to the return on short-term debt. Financing a \$100 billion deficit by issuing long-term debt raises the expected return on long-term debt by 0.10 percent, but lowers the expected return on equity by 0.24 percent, again in comparison to the return on short-term debt. These per-unit magnitudes are not huge, but in the current U.S. context of government deficits approximating \$200 billion—year after year—they are not trivially small either.

These results have immediate implications for the composition of private financing. In addition, in conjunction with some assumption (for example, about monetary policy) to anchor the overall return structure, they bear implications for the total volume of private financing, as well as for capital formation and other interest-sensitive elements of aggregate demand.

Economics of Information and the Theory of Economic Development

Joseph E. Stiglitz
Working Paper No. 1566
February 1985
JEL Nos. 020, 026, 121

This paper shows how recent developments in the economics of information can provide insights into economic relations in less developed countries and how they can provide explanations for institutions that, in neoclassical theory, appear anomalous and/or inefficient. I investigate sharecropping and other tenancy relationships in the rural sector, as well as wage determination and urban unemployment, within this perspective.

Macroeconomics, Income Distribution, and Poverty

Rebecca M. Blank and Alan S. Blinder
Working Paper No. 1567
February 1985
JEL No. 130

This paper investigates the impacts of macroeconomic activity and policy on the poverty population. It shows that both the poverty count and the income share of the lowest quintile of income recipients move significantly with the business cycle. We analyze at length the differential impact of inflation versus unemployment on low-income groups. The evidence indicates that unemployment has very large and negative effects on the poor, while inflation appears to have few effects at all. In addition, changes in tax policy since 1950 have led to decreasing progressivity in the overall tax structure. We pay special attention to changes in the poverty rate over the past decade and to prospective changes in the remainder of the 1980s.

Notes on the Effect of Capital Gains Taxation on Non-Austrian Assets

Daniel Kovenock and Michael Rothschild
Working Paper No. 1568
February 1985
JEL Nos. 323, 313

This paper attempts to assess the effect of capital gains taxation on non-Austrian assets, such as claims

to profits of continuing enterprises. As compared to taxation on an accrual basis, the capital gains tax discourages sales of appreciated assets. This is the "lock-in" effect. Because assets subject to capital gains taxation are generally held a long time, conventional estimates suggest that the effective rate of capital gains taxation is low. We contend that conventional estimates could seriously underestimate the effective rate of capital gains taxation because they ignore uncertainty. We construct a model that allows us to calculate the value of being able to actively manage a portfolio. We then use this model to calculate the effective rate of capital gains taxation. For several plausible parameter values, the effective rate is significantly higher than estimates under certainty. We also discuss some of the ways in which the lock-in effect may distort the allocation of investment funds and the efficient workings of the capital market.

Market, Government, and Israel's Muted Baby Boom

Yoram Ben-Porath
Working Paper No. 1569
February 1985

Cohorts born in Israel since the late 1940s were approximately 70 percent larger than earlier cohorts. This brought about changes in the age structure that are even more dramatic than the American baby boom. This paper follows the impact of the large cohorts on the school system and on the labor market, emphasizing the role played by the public sector.

In terms of the number of teaching posts, the school system on the whole demonstrated a very prompt ability to adjust to the pressure of a high number of pupils. However, as rates of growth of pupils decelerated, inputs in the school system failed to adjust downward. As a result, when the larger cohorts moved up the educational scale, the combination of rapid adjustment where they arrived and sluggish adjustment imparted an upward pressure on the aggregate expenditure on education.

When the large cohorts arrived at the age of entry into the labor force, the impact was delayed and muted by a rapid expansion of the army and of the universities. Relative earnings of young men aged 18-24 declined sharply during the decade. The earnings of the very young seem to be responsive to the relative size of a broader age group (18-34), as well as to the size of the elderly (65 plus).

Commodity Export Prices and the Real Exchange Rate in Developing Countries: Coffee in Colombia

Sebastian Edwards
Working Paper No. 1570
February 1985

In this paper, I develop a model that analyzes the interaction between changes in the prices of commodity exports, money creation, inflation, and the real exchange rate in a developing country. I then test the model using data for Colombia.

A number of experts have argued that the fluctuations in Colombia's real exchange rate have been determined mainly by changes in world coffee prices. More observers emphasize the consequences of changes in coffee prices on money creation and inflation. My results indicate that changes in coffee prices have indeed been related closely to money creation and inflation. Also, changes in coffee prices have been related negatively to the rate of devaluation of the crawling peg. In Colombia, therefore, the real appreciation resulting from increases in coffee prices has been accommodated partially by money creation and partially by an adjustment in the nominal exchange rate.

Macroeconomic Policy under Currency Inconvertibility

Jorge Braga de Macedo
Working Paper No. 1571
February 1985
JEL No. 431

This paper analyzes the macroeconomics of currency inconvertibility, building on the role of relative prices in a portfolio balance model. The relationship between black markets for foreign exchange and smuggling is analyzed first from the perspective of an individual importer. According to the portfolio view, the black market rate behaves like the financial rate in a dual market. The premium of the black market rate over the official rate is thus related to the probability of success in smuggling and to the tariff.

I then analyze the black market using a simple three-good, two-asset general equilibrium model. Under the assumption of regressive exchange rate expectations. I contrast the portfolio view with a monetary approach to the black market. Next I assess the short-run and long-run effects of monetary and exchange rate policies on relative prices. I contrast different assumptions about expected returns but emphasize the case of perfect foresight. Unless expectations are static, official exchange rate policy has to adjust to the private valuation of foreign exchange, as the conclusion of the paper stresses.

Bank Deregulation, Accounting Systems of Exchange, and the Unit of Account: A Critical Review

Bennett T. McCallum
Working Paper No. 1572
March 1985
JEL Nos. 311, 134

This paper reviews a specific group of recent publications by Black, Fama, Hall, and Greenfield and Yeager that: (1) encourage the relaxation of government controls on the banking industry, (2) emphasize the possibility of an economy in which most transactions are carried out through an accounting system rather than any tangible medium of exchange, and (3) suggest that improved monetary performance could be induced by separating the unit of account from the medium of exchange.

The main substantive conclusions are as follows: First, a system with an unregulated banking sector and a government-issued currency would be viable and might reduce inefficiencies resulting from reserve requirements—a point that has been recognized by neo-classical monetary economists. The second main class of systems discussed in the reviewed papers—one with a composite commodity medium of account and no convertibility provision—is quite different. If there were literally no medium of exchange, the noncoercive government designation of the unit of account would encounter no inconsistency but would be extremely fragile. More realistically, with some circulating private currency the latter would tend to become the medium of account as well as the medium of exchange and would tend to be issued in excess, thereby separating the unit of account from the officially designated bundle of commodities. The paper also develops several conclusions regarding analytical approach.

Exchange Rate Flexibility and the Transmission of Business Cycles

Jorge Braga de Macedo and David Meerscham
Working Paper No. 1573
March 1985
JEL No. 431

This paper presents a very simple model of the effects of flexible exchange rates in the transmission of business cycles. The starting point is the traditional "locomotive" effect, through exports and imports. Aside from this horizontal transmission, the intertemporal exchange rate model presented here allows for the effect of future internal shocks on home income (horizontal transmission) as well as for the effect of future

external shocks on home income (diagonal transmission). These channels highlight the role of flexible rates and follow from an intertemporal constraint on the trade balance.

In the presence of foreign-held debt, furthermore, the locomotive effect can be reversed, so that a foreign boom can cause a recession at home. We derive the determinants of the debt ceiling.

We simulate the model in the case of two symmetric countries with constant values for the policy variables and the interest rates at home and abroad.

Collective Pegging to a Single Currency: The West African Monetary Union

Jorge Braga de Macedo
Working Paper No. 1574
March 1985
JEL Nos. 431, 121

This paper presents a model of a monetary union that illuminates actual monetary and exchange rate policy in the West African Monetary Union (UMOA). It emphasizes the interaction of the members of UMOA with each other, through the common central bank, and their interaction with France and the rest of the world. As a consequence, the structure of the national economies depends essentially on their size. The relative size of the partners is reflected in the source and type of disturbances as well as in the trade pattern: large countries are not affected by disturbances originating in small countries. Small countries are affected by all external disturbances. The collective nature of the pegging becomes important because the small countries are taken to be of equal size.

Using a four-country, two-tier macroeconomic model, I show that the pseudo-exchange rate union with the large partner has no effect on the real exchange rates of the small countries but does affect their price levels; a full monetary union in principle requires a transfer between the two small countries the allocation of which by their common central bank may have real effects. This transfer is provided precisely by the large country, as guarantor of the fixed exchange rate arrangement. When both small countries are in surplus, there is a reverse transfer to the large country, with no monetary consequences. In line with the findings of the model, I provide evidence on monetary allocations in UMOA and on the real exchange rates of its major members, as compared to other African countries.

Real Interest Rates, Credit Markets, and Economic Stabilization

Paul Jenkins and Carl E. Walsh

Working Paper No. 1575

March 1985

We investigate the role of a real interest rate and a credit aggregate as intermediate targets of monetary policy under the assumption of rational expectations. The analysis expands a standard aggregate model to include a credit market and a market-determined interest rate on bank deposits. This allows us to examine the implications for output stabilization of real interest rate policy for a wider variety of shocks than are normally considered in the literature, as well as allowing us to study a credit aggregate policy.

Exchange Rate and Current Account Dynamics under Rational Expectations: An Econometric Analysis

David H. Papell

Working Paper No. 1576

March 1985

JEL No. 431

In this paper, I derive and estimate an econometric portfolio balance model of an open economy that incorporates exchange rates, prices, and current account dynamics. The usual stability conditions do not guarantee a unique, rational expectations solution, and I consider several proposals for resolving this situation. Using constrained maximum likelihood methods, I then estimate the model for Japan. The model is quite successful in explaining the patterns found in the data. Finally, I estimate the model using several methods of resolving the question of nonuniqueness and compare the results of each method.

The Real Exchange Rate as a Tool of Commercial Policy

Michael L. Mussa

Working Paper No. 1577

March 1985

JEL Nos. 430, 422

This paper develops a dynamic, rational expectations model that generalizes both the standard, two-

country, two-commodity model of real trade theory and the "dependent economy" model of open economy macroeconomics. I use this model to show how a variety of government policies can affect the real exchange rate (defined as the relative price of domestic goods in terms of foreign goods) and thereby to replicate some of the effects of commercial policy. The policies considered include: temporary and expected future shifts in the distribution of government spending; temporary general tax reductions financed by the issuance of government debt; controls on international capital movements; and policies that combine a fixed path of the nominal exchange rate and a fixed path of the nominal money supply (supported by sterilized official intervention in the foreign exchange market).

Collective Bargaining Laws and Threat Effects of Unionism in the Determination of Police Compensation

**Richard B. Freeman, Casey Ichniowski,
and Harrison Lauer**

Working Paper No. 1578

March 1985

This study examines the effect of public sector unions on compensation packages. The model of the process of compensation determination incorporates distinctive institutional aspects of public sector labor relations, in particular the differences among collective bargaining laws across states. We estimate the model using data on over 800 municipal police departments. Our results indicate that the effect of public sector unions depends critically on the institutional features of the public sector.

First, unionism thrives only in those states with protective legislation. Second, in states where unionism has flourished, it exerts a strong upward pressure on both union and nonunion compensation packages. Cross-section estimates for 1978 indicate that salaries of union and nonunion departments in highly unionized states are some 30 percent higher than are the salaries in states with low levels of unionism. However, we observe no significant difference between union and nonunion salaries within states.

Our before-and-after estimates of the "statewide union effect" are more modest (9.9 percent to 18.1 percent). Finally, there appears to be a more pronounced statewide union effect (on union and nonunion departments) on fringe benefits than on salaries. The net result is that in states that are highly organized, a greater proportion of the large compensation packages is paid in fringe benefits than in salaries.

Firm-Level Policy toward Older Workers

Olivia S. Mitchell and Rebecca A. Luzadis

Working Paper No. 1579

March 1985

JEL No. 800

This paper focuses on one aspect of long-term labor contracts—employer-provided pensions—in order to develop a better understanding of how such contracts affect the employment patterns of older workers. Pensions are one of the few elements of the employment package that explicitly describe long-term agreements between workers and their employers; consequently, they offer a unique opportunity to study these agreements. This paper combines labor supply theory and contract theory to examine pension responses to changes in taxes, Social Security benefits, and the federal government's recent decision to lift the age of mandatory retirement. Evidence on a longitudinal sample of pension plans from 1960 to the present suggests: (1) during 1960–70, increases in Social Security generated changes in pensions that favored early retirement; and (2) during 1970–80, some plans reduced private pension benefits in response to the higher age of mandatory retirement.

Money Demand Predictability

V. Vance Roley

Working Paper No. 1580

March 1985

JEL No. 311

The performance of empirical equations for money demand over the past decade raises serious questions about the predictability of money demand. A variety of specifications were presented to explain past episodes of apparent instability in money demand, but their success in predicting future money demand was limited in most instances. In particular, the unprecedented decline in the velocity of M1 during 1982 and 1983 was not captured fully by any of the previously modified conventional specifications.

This paper evaluates a variety of the approaches and specifications proposed in previous studies of money demand to explain the behavior of the narrowly defined money stock from the mid-1970s through 1983. The empirical results cast doubt on the appropriateness of the conventional specification of money demand in both the pre- and post-1974 periods.

A Variance Bounds Test of the Linear Quadratic Inventory Model

Kenneth D. West

Working Paper No. 1581

March 1985

JEL Nos. 211, 522

This paper develops and applies a novel test of the Holt et al. (1961) linear quadratic inventory model. A central property of the model is that a certain weighted sum of variances and covariances of production, sales, and inventories must be nonnegative. The weights are the basic structural parameters of the model. The model may be tested by seeing whether this sum is in fact nonnegative. When the test is applied to some data on nondurables aggregated to the two-digit SIC code level, it almost always rejects the model, even though the model does well by traditional criteria.

Labor Relations, Wages, and Nonwage Compensation in Municipal Employment

Jeffrey S. Zax

Working Paper No. 1582

March 1985

In the private sector, "unionization" typically refers to employees who are organized, recognized, and covered by contracts according to the procedures established by the National Labor Relations Board. The municipal sector provides an instructive contrast. There, unionization encompasses five mutually exclusive combinations of organizational structure and labor relations practice. These modes form a hierarchy of employee power, from strongest to weakest: (1) recognized bargaining units; (2) unrecognized unions in cities that contain other recognized unions; (3) unorganized employees in cities that contain recognized unions; (4) unrecognized unions in cities that contain no recognized unions; and (5) unorganized employees in cities that contain no recognized unions. Differences in the effects of each mode on compensation for municipal employees demonstrate differences in the intrinsic strength of different union institutions.

Municipal compensation levels are dramatically higher for employees represented by more powerful modes of unionization, regardless of other conditions in factor and output markets. Union effects on total compensation, in comparison to its mean, range from

3.8 percent for unrecognized unions in cities that contain no recognized bargaining units, to 11.8 percent for recognized bargaining units, themselves.

In addition, union effects on total compensation are greater than union effects on wages in all modes. Relative union effects on expenditures for paid time not worked and pension benefits are usually more than twice wage effects. Union effects on medical benefits are nearly twice wage effects.

On the Complementarity of Commercial Policy, Capital Controls, and Inflation Tax

Joshua Aizenman
Working Paper No. 1583
March 1985
JEL Nos. 420, 430

This paper studies the optimal use of distortive policies aimed at raising a given real revenue. I use a general equilibrium framework with no lump-sum taxes to analyze an inflation tax, commercial policy, and an implicit tax on capital inflows implemented by capital controls. I show that an inflation tax is not likely to be used for small revenue needs. Furthermore, if the policy target were allocative, only one policy instrument would be used. Thus, each policy has its own comparative advantage, and their combined use is justified when the target is higher government revenue. As a by-product of this paper, I study the determinants of exchange rates, prices, and quantities in an economy subject to capital controls and commercial policy.

International Monetary Policy to Promote Economic Recovery

Willem H. Buiter
Working Paper No. 1584
March 1985
JEL Nos. 431, 134

This paper studies the design of efficient anti-inflationary policies in a two-country, interdependent economic system. I consider a number of specifications of the price formation process, incorporating successively higher degrees of price level and inflation inertia.

Credibility of current announcements of future monetary policy is necessary and sufficient for costless, immediate disinflation only in the classical, flexible price level model with forward-looking rational expectations.

If price level inertia prevails, deceleration of the money growth rate must be accompanied by nominal money "jumps" or cost-reducing tax cuts; this accommodates the fall in velocity that accompanies successful disinflation, if the transition is to be costless (and immediate). With a sluggish price level and sluggish core inflation, tax cuts (or incomes policy) are necessary for costless disinflation. In general, the elimination of inflation can only be gradual. With real balance effects on demand, unilateral disinflationary policy always "spills over" through real interest rates and the real exchange rate. They are necessary for the presence of spillovers only in the classical model. Cooperative policy design effectively leaves the national authorities with the same scope for influencing domestic target variables that they would have had in a closed economy.

A Disaggregated, Structural Analysis of Retirement by Race, Difficulty of Work, and Health

Alan L. Gustman and Thomas L. Steinmeier
Working Paper No. 1585
March 1985
JEL Nos. 813, 820

We examine intergroup differences in retirement rates by race, major occupation, and health status and allocate them to differences in budget sets and indifference curve parameters. Comparisons indicate that average retirement rates for groups may at times be misleading indicators of marginal responses to incentives. We predict that all groups will respond to the work incentives in the 1983 Social Security Amendments, even those in ill health and those with difficult jobs. The resulting increases in earnings will range from one-sixth to over one-half of the reduction in lifetime benefits created by the amendments.

Macroeconomic Stabilization through Taxation and Indexation: The Use of Firm-Specific Information

Stephen J. Turnovsky and Richard C. Marston
Working Paper No. 1586
March 1985
JEL No. 430

This paper considers two alternative approaches to stabilizing an economy with firm-specific productivity disturbances. The first uses wage contracts that tie wages in each firm to these disturbances as well as to

the price level. The second uses a tax on firms that modifies their supply behavior together with a simple wage indexation rule that ties wages to prices alone. Both these schemes are viable as long as the firm-specific disturbance is known to all agents. If the firm alone observes the productivity disturbance, it has an incentive under either scheme to misrepresent current conditions. However, a combination of these two schemes maximizes welfare and is compatible with incentives.

Shifts in the Nineteenth-Century Phillips Curve Relationship

John A. James

Working Paper No. 1587

March 1985

JEL No. 042

This paper examines shifts in the output effects of unanticipated inflation in the nineteenth-century United States by estimating a Lucas-type aggregate supply function over the 1840–1900 period. It shows that, in contrast to the twentieth-century experience in which there has been a pronounced movement toward greater cyclical price rigidity, the nineteenth-century output response to unanticipated price changes was roughly stable over the period. Such stability is also particularly interesting in view of the dramatic changes in communications and transportation technology, particularly the telegraph and the railroad, which greatly facilitated information flows and thereby should have forced the price-surprise coefficient downward. Other factors that may have offset the influence of these improvements in information technology on the price-surprise coefficient include the reduced variability of the general price level caused by the gold standard in the post-bellum period and the possibility that the net effects of such improvements may in fact have been small because shocks were able to spread more rapidly. Finally, the perceived increase in cyclical price rigidity in the raw data over the nineteenth century resulted not from a change in price-surprise coefficient but rather from an increased degree of persistence or inertia in the economy.

Game Modeling the Tokyo Round of Tariff Negotiations

Robert E. Baldwin and Richard N. Clarke

Working Paper No. 1588

March 1985

JEL No. 422

Using actual data on trade and tariffs for the United States and the European Community, this paper dem-

onstrates how a trade negotiation such as the Tokyo Round can be modeled as a game among countries attempting to minimize functions for individual welfare loss. Once welfare functions are constructed, we compute both noncooperative and cooperative Nash equilibriums. These welfare outcomes are then compared with those that arise from the initial tariff structure as well as the structure actually determined by the negotiation. We find that while the game model may track closely the decisions of the negotiators in the Tokyo Round, later unilateral political decisions resulted in less "optimal" tariffs.

Monetary Information and Interest Rates

Carl E. Walsh

Working Paper No. 1589

March 1985

JEL No. 311

This paper develops a model of movements in interest rates in response to new information on the money stock. The model, which incorporates several earlier approaches as special cases, makes explicit the manner in which estimated interest rate responses to money surprises depend on the relative variances of nominal and real disturbances, as well as on the monetary authority's policy and the credibility of that policy.

Exchange Rate Management: Intertemporal Trade-Offs

Elhanan Helpman and Assaf Razin

Working Paper No. 1590

March 1985

The management of the exchange rate is possible only if the government pursues a monetary-fiscal policy mix that is consistent with its exchange rate targets. In this paper, with uncertainty concerning the length of individual life, the real consequences of exchange rate management depend on the precise time pattern of the accompanying policies. We look at a stylized example of disinflation by means of exchange rate targeting with an initial overvalued currency and a delayed accompanying absorption policy. The result is an intergenerational redistribution of welfare whereby spending rises during the initial period and falls during later periods, while the external debt rises in all periods.

Purchasing Power Parity

Rudiger Dornbusch
Working Paper No. 1591
March 1985

This paper surveys purchasing power parity (PPP) theory and evidence; it was prepared for the *New Palgrave* dictionary of economics. Following a statement of the absolute and relative versions of the theory, there is a brief sketch of the history of thought with emphasis on Cassel and the monetary approach. A theoretical section then distinguishes structural and transitory deviations from PPP. The main basis for structural deviations is the Ricardo-Harrod-Balassa-Samuelson model of productivity differentials that affect the real prices of home goods and hence real price levels. Transitory deviations emerge from differential speeds of goods and asset markets. In particular, sticky wages combined with imperfect competition or spatial discrimination in pricing give rise to sometimes persistent movements in real exchange rates. After an overview of empirical evidence, the paper concludes with a review of the implications of PPP disparities and also discusses applications to international real income comparisons, interest rate linkages, and exchange rate policy.

The Effect of the Treasury Proposal on Charitable Giving: A Comparison of Constant and Variable Elasticity Models

Lawrence B. Lindsey
Working Paper No. 1592
March 1985
JEL No. 323

The recent proposal for tax reform developed by the Department of the Treasury suggests dramatic changes in the structure of the personal income tax. One likely side effect of the changes will be a significant adverse impact on the level of charitable contributions by individuals.

Using the existing literature on the price and income elasticities of charitable behavior, this paper evaluates the marginal effect on giving of various parts of the Treasury reform plan. I simulate two explicit models for 1985 using the NBER TAXSIM model: one with constant price and income elasticities, and one with price and income elasticities that vary with income.

Optimal Time-Consistent Fiscal Policy with Uncertain Lifetimes

Guillermo A. Calvo and Maurice Obstfeld
Working Paper No. 1593
March 1985
JEL Nos. 133, 321

This paper studies optimal fiscal policy in an economy in which heterogeneous agents with uncertain lifetimes coexist. We show that some plausible social welfare functions lead to time-inconsistent optimal plans; we suggest restrictions on social preferences that avoid the problem. The normative prescriptions of a time-consistent utilitarian planner generalize the "two-part Golden Rule" suggested by Samuelson and imply aggregate dynamics similar to those arising in the Cass-Koopmans-Ramsey optimal growth framework. We characterize lump-sum transfer schemes that allow the optimal allocation to be decentralized as the competitive equilibrium of an economy with actuarially fair annuities. The lump-sum transfers that accomplish this decentralization are, in general, age dependent.

Parsimonious Modeling of Yield Curves for U.S. Treasury Bills

Charles R. Nelson and Andrew F. Siegel
Working Paper No. 1594
March 1985

We propose a new model to represent the term-to-maturity structure of interest rates at a point in time. The model produces humped, monotonic, and S-shaped yield curves using four parameters. Conditional on a time decay parameter, estimates of the other three may be obtained by least squares. We then present yield curves for 37 sets of U.S. Treasury bill yields with maturities up to one year. The median standard deviation of fit is just over seven basis points, and the corresponding median R-squared is 0.96. The residuals suggest the existence of specific maturity effects not previously identified. Using the models to predict the price of a long-term bond provides a diagnostic check and suggests directions for further research.

High School Graduation, Performance, and Earnings

Andrew Weiss
Working Paper No. 1595
April 1985

This paper uses data from the Panel Study of Income Dynamics (PSID) and from a proprietary sample of semiskilled production workers to investigate the rea-

sons for the discontinuous increase in wages that is associated with high school graduation.

I find a discontinuous decrease in a worker's propensities to quit or be absent that is associated with high school graduation. However, high school graduates have no comparative advantage on production jobs that require more training. Nor, in the PSID sample, are high school graduates assigned to jobs requiring more training. Finally, the wage premium associated with high school graduation vanishes during severe slumps, periods in which employers are likely to be hoarding labor and in which quits and absences are least important to firms.

From this evidence I conclude that the sorting model of education provides a better explanation for the higher wages of high school graduates than does the human capital model.

On the Consequences and Criticisms of Monetary Targeting

Bennett T. McCallum

Working Paper No. 1596

April 1985

JEL Nos. 311, 130

The purpose of this paper is to review and evaluate the most important existing criticisms of policy strategies that feature adherence to money stock targets. I analyze four main categories of criticism (and counter-arguments). The first of these involves the claim that accurate money stock control is infeasible; the second contends that such control can only be obtained along with extreme volatility of interest rates. The third emphasizes difficulties resulting from technical change and deregulation; the fourth concerns strategic issues of rules versus discretion, activist versus nonactivist policy, and the logical function of intermediate targets.

The Effect of Job Complexity on Job Satisfaction: Evidence from Turnover and Absenteeism

Andrew Weiss

Working Paper No. 1597

April 1985

Using a detailed sample of semiskilled production workers, I find that (holding a wide range of personal and job-related characteristics constant) workers assigned to more complex jobs seem to be more likely to quit than workers assigned to simpler jobs. Job complexity has no discernible effect on absenteeism. Matching better-educated workers to more complex jobs affects neither absenteeism nor the propensity to quit.

Thus, it appears that experimental evidence suggesting that job enlargement does increase worker satisfaction likely stems from the experimental design: asking for volunteers to be assigned more complex jobs, and improving the quality of supervision of the workers assigned to these more complex jobs.

Capital Flows, Investment, and Exchange Rates

Alan C. Stockman and Lars E. O. Svensson

Working Paper No. 1598

April 1985

JEL No. 430

This paper incorporates international capital flows into a two-country, monetary-general equilibrium model of asset prices with investment and production. We use the model to calculate theoretical covariances among investment, the current account, the exchange rate, and the terms of trade. These covariances depend upon the coefficient of relative risk aversion, the magnitude and sign of a country's net international indebtedness, other properties of tastes and technologies, and the stochastic processes on disturbances to productivity and monetary growth rates. International capital flows arise from changes in world wealth and its relative composition in foreign and domestic assets. The dynamic, stochastic relations between capital flows, exchange rates, and the terms of trade are critically dependent on optimal portfolio allocations and the stochastic behavior of asset prices on international financial markets.

An Empirical Examination of Municipal Financial Policy

Roger Hall Gordon and Joel Slemrod

Working Paper No. 1599

April 1985

Current U.S. tax law creates a variety of incentives that affect municipal financial policy. Under current law, municipalities can borrow at a tax-exempt interest rate while earning the full market rate of return on any assets they hold. In contrast, municipal residents who borrow or lend as individuals either pay or earn the market rate of return *after* personal income taxes. These differences in rates of return create many opportunities for arbitrage, allowing communities or residents to borrow at low rates and invest at higher rates.

This paper empirically examines the financial policy of municipalities in four states (Connecticut, Maine, Massachusetts, and Rhode Island) to see to what degree these municipalities attempt to take advantage of

each of the available opportunities to engage in tax arbitrage. Our data come from the 1980 U.S. Census of Population and Housing, and the 1977 U.S. Census of Governments. We find clear evidence that communities do actively engage in such tax arbitrage.

Does the Tax System Favor Investment in High Tech or Smokestack Industries?

Don Fullerton and Andrew B. Lyon
Working Paper No. 1600
April 1985
JEL No. 323

When tax rates vary by asset, a "hidden" industrial policy may aid industries that invest in a certain mix of assets. In this paper, we examine whether differential use of depreciable assets gives rise to differential tax treatment of high technology industries relative to other industries. First, we calculate the total effective tax rate on a marginal investment in each of 34 assets. Next, using these asset-specific tax rates and weighting by the use of these assets in each of 73 different industries, we calculate total effective tax rates at the industry level. We find considerable variation within the high tech sector and within the more traditional sector. For the case of a taxable firm with a given debt-equity ratio, though, there are no systematic differences between overall rates in the two sectors.

Ruling Out Nonstationary Speculative Bubbles

Maurice Obstfeld and Kenneth Rogoff
Working Paper No. 1601
April 1985
JEL Nos. 131, 133

There is a large and growing empirical literature that considers the existence of asset-price bubbles, or "sunspot" equilibriums (that is, equilibriums unrelated to market fundamentals). Our view is that tests even for nonstationary asset-price bubbles should not be interpreted as such. In this paper, we extend our earlier work that provided a strong case for ruling out nonstationary speculative price bubbles in models based on individual maximizing behavior. In the first part of the paper, we study the possibility of stochastic exploding price-level bubbles of the kind proposed by Blanchard (1979). As in our previous work, a scheme of fractionally backing the currency with real output is sufficient to preclude such bubbles. In the second part of the paper, we examine conditions for ruling out implosive price-level bubbles, or equilibrium paths along which the

price level tends asymptotically toward zero even though the money growth rate is constant. A condition on preferences implied by any reasonable technology for money transactions is sufficient to prevent such bubbles from emerging. Given that anticipated future disturbances can lead to price paths that are qualitatively indistinguishable from bubble paths, and given the strong theoretical basis for ruling out nonstationary bubbles, our conclusion is that any "positive" evidence of bubbles should be regarded only as evidence of omitted variables.

How Does the Market Value Unfunded Pension Liabilities?

Jeremy I. Bulow, Randall Mørck, and Lawrence H. Summers
Working Paper No. 1602
April 1985

We begin by discussing a number of theoretical reasons to expect certain relationships between a firm's unfunded pension liability and its market value. We then discuss our doubts about the methodology—standard cross-sectional techniques—used in earlier papers on the empirical relation between funding and market value. A modified cross-sectional approach alleviates some of these doubts, and a "variable effect event study" methodology alleviates most of them. Both are employed to investigate the issues raised in the first part of the paper. Our conclusion confirms earlier studies: unfunded pension liabilities are accurately reflected in lower share prices.

Real Aspects of Exchange Rate Regime Choice with Collapsing Fixed Rates

Robert P. Flood and Robert J. Hodrick
Working Paper No. 1603
April 1985
JEL No. 431

Typical evaluations of the choice of exchange rate regime employ a criterion function that depends on the real performance of the economy. They also focus on regimes that are expected to last indefinitely. This latter feature is strongly contradicted by the transitory nature of actual regimes. Our paper extends the recent literature on collapses of fixed exchange rate regimes with exogenous real sectors. We examine how the predictions of two popular models for the determination of some real economic variables must be modified when agents rationally perceive that the fixed rate regime will be transitory. The models are simple stochastic versions of the ones in Dornbusch (1976) and Flood and Marion (1982).

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