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# NBER Reporter

NATIONAL BUREAU OF ECONOMIC RESEARCH, INC.

WINTER 1983/4

## Program Report

### Taxation

David F. Bradford

Although producing at a rate perhaps insufficient to keep up with tax legislators, the Bureau's tax researchers have been very active during the period since my last program report in the Summer 1981 issue of the *NBER Reporter*. The efforts of program members have ranged over a broad spectrum of topics, from the foundations of taxation to material more directly linked to specific policy developments. Program activities have included regularly scheduled meetings at the Cambridge office and workshops as part of the NBER Summer Institute. In addition, tax program members were centrally involved in various NBER projects, including the Conference on Applied General Equilibrium Models in San Diego, August 24-28, 1981,<sup>1</sup> the Conference on Microdata and Public Economics, held at Oxford, England, in June 1982 (jointly sponsored by the Bureau and the British Social Science Research Council),<sup>2</sup> and the Conference on Incentive Effects of Government Spending, held in Cambridge, November 5-6, 1982.

Most Bureau tax research is available in the NBER Working Papers or NBER Reprints series. While it is not possible here to do justice to all of this work, I shall try to suggest the flavor of the research that has been done in several broad categories.

#### Effective Tax Rates

Considerable attention has been paid to the problem of defining and measuring the rate of tax applicable to various activities. It is generally taken for granted in our theories that tax rates are easily observable: the tax

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This issue of the *Reporter* highlights the Bureau's Program in Taxation. Alan J. Auerbach discusses recent developments in U.S. corporate taxation. Then, Anna J. Schwartz describes her research on monetary issues. After the quarterly Economic Outlook Survey are biographical sketches, the Conference Calendar, and other NBER news and reports. The *Reporter* concludes with short summaries of recent NBER Working Papers.

on cigarettes is 25 cents per pack, for example. Actually, however, in many contexts the tax rate is very hard to determine. This is especially likely in the case of activities affected by income taxes, which are levied at graduated rates and are determined by the application of rather complicated accounting rules.

For example, Arnold Harberger required a number to attach to the tax rate on corporate capital that appeared in the theory in his well-known analysis of the efficiency cost of the corporate income tax (the burden in excess of the tax revenue raised).<sup>3</sup> But it was not obvious what that number should be. The statutory corporate tax rate varies according to the income of the firm. Accelerated depreciation, investment credits, and the like cloud the

<sup>1</sup>The conference papers will appear in a forthcoming University of Chicago Press book, edited by Herbert E. Scarf and John B. Shoven.

<sup>2</sup>The Oxford conference papers are scheduled to be published as an issue of the *Journal of Public Economics*.

<sup>3</sup>A. Harberger, "Efficiency Effects of Taxes on Income from Capital," in M. Krzyzaniak, ed., *Effects of Corporation Income Tax*, Detroit: Wayne State University Press, 1966.

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picture further. To cut through these complexities, Harberger used a measure that Research Associate Don Fullerton calls the "average effective corporate tax rate," defined as the ratio of observed corporate taxes to an estimate of real corporate income.

This is just one of several possibilities under the classification suggested by Fullerton in an excellent overview of the conceptual and measurement problems bedeviling the analyst of taxes on capital.<sup>4</sup> He distinguishes six types of effective tax rates. Joining the average effective corporate tax rate in his scheme are the "average effective total tax rate" (which adds property taxes and personal taxes on interest, dividends, and capital gains), the "marginal effective corporate tax wedge" (that is, the expected real pretax rate of return on a new investment less the real aftertax rate of return accruing to the corporation), the "marginal average effective total tax wedge" (pretax rate of return less the return to the individual saver after all taxes), and two marginal tax rates (the two tax wedges divided by the rate of return).

Fullerton not only defines these various versions of "the" effective rate of taxation of capital, but he also provides a list of important papers employing each one. The potential for confusion is obvious, and Fullerton stresses the importance of keeping clearly in view the legitimate uses for each. The principal division is between measures of the burden of taxes arising from decisions made in the past (for which some sort of average tax rate is relevant) and measures of the incentive effects bearing on current saving and investment decisions (for which a marginal rate is required). Harberger's problem, for example, called for a marginal rate, and (as he recognized) the validity of his excess burden calculations is dependent on an assumption of equality between marginal and average rates.

NBER research has included measurement of both average and marginal tax rates on capital income. In a paper prepared for the June 1982 Oxford conference, Martin Feldstein, James Poterba, and Louis Dicks-Mireaux provide carefully justified annual time-series estimates of the pretax profits of nonfinancial corporations in the United States for 1950-79, with the associated flow of tax payments.<sup>5</sup> According to their figures, the pretax real rate of return averaged a rather high 12.7 percent during the 1960s and a relatively low 9.8 percent during the 1970s. The unweighted mean "average total effective tax rate" (to use Fullerton's term) was 59.6 percent for the 1960s and 68.7 for the 1970s.

In view of the extreme complexity of the actual tax system, it would naturally be convenient if these or similar estimates could be used in place of marginal tax rates in calculating the effects of taxes on resource allocation, the technique employed by Harberger in

<sup>4</sup>D. Fullerton, "Which Effective Tax Rate?" *NBER Working Paper No. 1123*, May 1983.

<sup>5</sup>M. Feldstein, J. M. Poterba, and L. Dicks-Mireaux, "The Effective Tax Rate and the Pretax Rate of Return," *NBER Working Paper No. 740*, September 1981.

the study mentioned above (note 3). Unfortunately, the procedure is not without risks, as is illustrated in the analysis by Fullerton and Yolanda Henderson of the accelerated cost recovery system (ACRS) introduced to the tax law by the Economic Recovery Tax Act of 1981.<sup>6</sup> They develop measures of the average and marginal effective corporate tax rates for each of 18 U.S. industries and find virtually no resemblance between the two sets of rates. (I shall touch on their substantive findings in the discussion of simulation research.)

Research Associate Mervyn King has teamed up with Fullerton to take the lead in one of the most ambitious efforts under the heading of effective tax rates. In a project involving several members of the program, the Bureau is joined by the Industrial Institute for Economic and Social Research of Stockholm and the IFO Institute of Munich in developing a comparison of the taxation of nonfinancial corporate capital in the United States, the United Kingdom, Sweden, and the Federal Republic of Germany. Instead of focusing primarily on a single number to represent "the" effective rate, the researchers derive measures of the marginal total tax rate on typical saving-investment "projects."<sup>7</sup> In its final form the study classifies all nonfinancial corporate investment into 81 distinct projects, differentiated by type of asset (machinery, buildings, inventories), industry (manufacturing, commerce, other industry), type of finance (debt, new share issue, retained earnings), and identity of the saver (household, tax-exempt institution, life insurance company). The "illustrative project" technique permits the analysts to deal with variations in the many dimensions of tax systems (rules for determining depreciation allowances, regional investment grants, wealth taxes, and so forth), as well as differences in such characteristics of the economies as inflation rates, capital stock structures, and durability of capital. Among the principal findings of the international tax comparison project is confirmation of the extraordinary dispersion of the effective rates of tax, within each country, among the illustrative savings-investment combinations.<sup>8</sup>

These and other results are set forth in a volume to be published in 1984.<sup>9</sup> In addition to its innovative approach, the book will provide a remarkably rich source

<sup>6</sup>D. Fullerton and Y. K. Henderson, "Long-Run Effects of the Accelerated Cost Recovery System," NBER Working Paper No. 828, December 1981.

<sup>7</sup>For a description of the approach, see M. A. King and D. Fullerton, "The Taxation of Income from Capital: A Comparative Study of the United States, United Kingdom, Sweden, and West Germany—The Theoretical Framework," NBER Working Paper No. 1058, January 1983.

<sup>8</sup>For a summary of the findings, see M. A. King and D. Fullerton, "The Taxation of Income from Capital: A Comparative Study of the United States, United Kingdom, Sweden, and West Germany—Comparisons of Effective Tax Rates," NBER Working Paper No. 1073, April 1983.

<sup>9</sup>M. A. King and D. Fullerton, eds., *The Taxation of Income from Capital: A Comparative Study of the United States, United Kingdom, Sweden, and West Germany*, Chicago: University of Chicago Press, forthcoming April 1984.

of information about the tax systems of these representative industrial economies, with quantitative measures of the structure of their capital stocks and financial structures.

Still other work in the program involved effective tax rates. In the same general approach just described, David Bradford and Don Fullerton show how sensitive calculations of effective rates may be to assumptions that are often only casually justified.<sup>10</sup> To give a simple instance, a tax wedge of 2 percent (annually) of the value of the capital involved amounts to an effective income tax rate of 75 percent if the assumed before-tax rate of return is 3 percent annually, but only 20 percent if the assumed rate of return is 10 percent. Patric Hendershott and Joel Slemrod develop measures of the tax rate appropriate for use in the calculation of the user cost of capital specifically for owner-occupied housing.<sup>11</sup>

Joseph Stiglitz analyzes the effective taxation of various transactions implied by the U.S. rules for including capital gains in income.<sup>12</sup> He shows that with "perfect" capital markets (unlimited secured borrowing and lending at the going interest rate), rational investors can avoid not only taxes on capital income, but also all income taxes. He also discusses the bearing on the results of the modeling of capital market imperfections (limitations on borrowing). His general conclusion: the impact of the tax is not adequately summarized by any effective tax rate. Alan Auerbach looks at the effects of the asymmetry in the tax law between the treatment of positive and negative corporate income (losses may be carried forward).<sup>13</sup>

Daniel Feenberg, who has general oversight of the Bureau's TAXSIM model (a sample of federal income tax returns with the software required to calculate actual and hypothetical alternative taxes) has developed a technique to circumvent a vexatious estimation problem arising in studies that require estimates of the effective tax on such transactions as capital gains realizations.<sup>14</sup> Users of cross-section data, such as that provided by TAXSIM, must generally rely for tax rates on values calculated from such variables as income and marital status, creating identification problems when the same variables may be expected to exert an effect in their own right. Feenberg proposes an instrumental variable technique allowing unbiased estimates of tax-price elasticities under quite general conditions.

<sup>10</sup>D. F. Bradford and D. Fullerton, "Pitfalls in the Construction and Use of Effective Tax Rates," NBER Working Paper No. 688, June 1981.

<sup>11</sup>P. H. Hendershott and J. Slemrod, "Taxes and the User Cost of Capital for Owner-Occupied Housing," NBER Working Paper No. 929, July 1982.

<sup>12</sup>J. E. Stiglitz, "Some Aspects of the Taxation of Capital Gains," NBER Working Paper No. 1094, March 1983.

<sup>13</sup>A. J. Auerbach, "The Dynamic Effects of Tax Law Asymmetries," NBER Working Paper No. 1152, June 1983.

<sup>14</sup>D. Feenberg, "Identification in Tax-Price Regression Models: The Case of Charitable Giving," NBER Working Paper No. 988, September 1982.

To illustrate the method, he estimates the demand elasticity for charitable giving (finding a point estimate of -1.23) putting to use a newly created capacity to calculate the state tax liabilities of federal taxpayers in the TAXSIM file.

One of the more elusive tax rates is that induced on labor earnings by the Social Security system. The payroll tax, the earnings test (for retired individuals) and its offsetting actuarial adjustment, and the dependence of future benefits on the level of current earnings all influence the return to extra work. Roger Gordon estimates the net tax rate on labor earnings in a variety of circumstances, taking careful account of both the Social Security and income tax systems.<sup>15</sup> His somewhat surprising finding is that for many people in the past the Social Security system's net subsidy effectively offset the income tax at the margin. The net subsidy rate has been declining over time, however.

Finally, in a quite different vein, Research Associate Michael Rothschild collaborated with Robert Moffitt to investigate the interaction between variable income and a nonlinear tax transfer system. They show that the resulting effective tax penalizes (and sometimes rewards) income variability in a manner they describe as "both substantial and capricious."<sup>16</sup>

## Simulation

In my previous program report I described the work presented at a conference on simulation; a conference volume has since been published.<sup>17</sup>

The Bureau's interest in simulation methods remains active. Among the most rapidly developing simulation tools are computable models of general equilibrium in a full system of markets. Fullerton prepared a most useful overview, this time on general equilibrium models, for the August 1981 San Diego conference, in collaboration with Henderson and Shoven. In their paper they review a number of studies that use models of general equilibrium in a full system of competitive markets.<sup>18</sup> They compare these models and outline likely directions for further development of the technique.

Illustrations of the use of the method for policy analysis are provided by: (1) Fullerton and Henderson,<sup>19</sup> who conclude that the accelerated cost recovery system

introduced to the U.S. income tax law in 1981 will generate long-run efficiency gains (although smaller gains than would have been created by alternative plans considered in the same legislative process); (2) Fullerton, Shoven, and John Whalley,<sup>20</sup> who explore the time path of the economy through a sequence of general equilibriums following a policy change (a shift from income to consumption basis for taxation) under the assumptions that the economy starts on a balanced growth path and that household expectations are myopic (they expect current prices to hold in the future); (3) Charles Ballard, Shoven, and Whalley,<sup>21</sup> who estimate the efficiency cost of raising an additional dollar of revenue through proportional change in all taxes (in the range of 34 to 48 cents, they conclude), and the efficiency gains available via illustrative alternative feasible policy changes; and (4) Fullerton,<sup>22</sup> to test the sensitivity of policy choices to the values of key parameters.

Other general equilibrium policy analyses, similar in spirit but using models differing in detail, have also been carried out in the context of the tax program. Hendershott and James D. Shilling develop a five-asset, four-household simulation model to measure the long-run impacts of the major provisions of the Economic Recovery Tax Act of 1981 on the allocation of a fixed capital stock among owner-occupied housing, rental housing, and nonresidential capital.<sup>23</sup> Their analysis indicates a 6 percent increase in nonresidential capital, an 11 percent decline in owner-occupied housing, and little change in rental housing, with approximate equalization of the user cost of capital of all three types. Under their fixed capital stock, closed-economy assumption, real pretax interest rates are predicted to rise by nearly two percentage points as a consequence of the tax law changes.

Roger Gordon and Faculty Research Fellow Joel Slemrod constructed a model to simulate the effects of eliminating either of two federal policies encouraging local government expenditures: income tax deductibility of local tax payments and the tax-exempt status of interest on municipal bonds.<sup>24</sup> In their model, eliminating the deductibility of local taxes appears advanta-

<sup>15</sup>R. H. Gordon, "Social Security and Labor Supply Incentives," *Contemporary Policy Issues* 3, April 1983, pp. 16-22. (Formerly NBER Working Paper No. 986.)

<sup>16</sup>R. Moffitt and M. Rothschild, "Variable Earnings and Nonlinear Taxation," NBER Working Paper No. 1163, June 1983.

<sup>17</sup>M. Feldstein, ed., *Behavioral Simulation Methods in Tax Policy Analysis*, Chicago: University of Chicago Press, 1983.

<sup>18</sup>D. Fullerton, Y. K. Henderson, and J. B. Shoven, "A Comparison of Methodologies in Empirical General Equilibrium Models of Taxation," NBER Working Paper No. 911, June 1982.

<sup>19</sup>D. Fullerton and Y. K. Henderson, "Long-Run Effects of the Accelerated Cost Recovery System," NBER Working Paper No. 828, December 1981.

<sup>20</sup>D. Fullerton, J. B. Shoven, and John Whalley, "Replacing the U.S. Income Tax with a Progressive Consumption Tax: A Sequenced General Equilibrium Approach," NBER Working Paper No. 892, May 1982.

<sup>21</sup>C. L. Ballard, J. B. Shoven, and J. Whalley, "The Welfare Cost of Distortions in the U.S. Tax System: A General Equilibrium Approach," NBER Working Paper No. 1043, December 1982.

<sup>22</sup>D. Fullerton, "Uncertain Parameter Values and the Choice among Policy Options," NBER Working Paper No. 1111, April 1983.

<sup>23</sup>P. H. Hendershott and J. D. Shilling, "The Impacts on Capital Allocation of Some Aspects of the Economic Recovery Tax Act of 1981," *Public Finance Quarterly* 10, 2, April 1982. (Formerly NBER Working Paper No. 825.)

<sup>24</sup>R. H. Gordon and J. Slemrod, "A General Equilibrium Simulation Study of Subsidies to Municipal Expenditures," *Journal of Finance* 38, 2, May 1983, pp. 585-594. (Formerly NBER Working Paper No. 1080.)

geous to all groups, while making municipal bonds taxable substantially hurts the well-to-do (who lose a tax shelter) and may hurt the very poor (who pay more for municipal services). Slemrod has been particularly interested in the general equilibrium effects of taxes as they work through financial markets. In an analysis of tax effects on the allocation of capital among sectors and among individuals, he concludes that the portfolio distortions (the interhousehold pattern of asset ownership, including owner-occupied housing) may be more important than the intersectoral distortions usually emphasized.<sup>25</sup>

Research Associates Auerbach and Laurence J. Kotlikoff have continued their work on consumption behavior in general equilibrium of saving and investment decisions in a world of overlapping generations of life-cycle savers. They were joined by Jonathan Skinner in a simulation of the effects of switching from a proportional income tax to either a proportional tax on consumption or a proportional tax on labor income.<sup>26</sup> Although the latter two taxes can be rendered algebraically equivalent in their model (wages are the only source of income other than the yield from past savings), the switch to a consumption tax has the effect of a lump-sum levy on past accumulations, providing long-term benefits to future generations (at a cost to the old at the time of transition). A similar effect is at work in an analysis carried out by Auerbach and Kotlikoff of the differences between investment incentives (directed to newly produced capital) and savings incentives (directed to new and old capital alike).<sup>27</sup>

In their survey of general equilibrium models, Fullerton, Henderson, and Shoven note various directions along which further research might proceed. Among them is the relaxation of the assumption of price-taking competitive equilibrium. The difficulties of modeling noncompetitive equilibrium are well known, but it does seem important that more effort be devoted to putting developments in the field of industrial organization to work in tax analysis. A beginning has been made by Research Associate Harvey S. Rosen, in collaboration with Michael L. Katz.<sup>28</sup> Unfortunately, as one might expect, they find that erroneous specification of market structure leads to serious errors in the analysis of tax effects. The program is actively encouraging further work along these lines.

<sup>25</sup>J. Slemrod, "Tax Effects on the Allocation of Capital among Sectors and Individuals: A Portfolio Approach," NBER Working Paper No. 951, August 1982.

<sup>26</sup>A. J. Auerbach, L. J. Kotlikoff, and J. Skinner, "Efficiency Gains from Dynamic Tax Reform," NBER Working Paper No. 819, December 1981.

<sup>27</sup>A. J. Auerbach and L. J. Kotlikoff, "Investment versus Savings Incentives: The Size of the Bang for the Buck and the Potential for Self-Financing Business Tax Cuts." in L. H. Meyer, ed., *The Economic Consequences of Government Deficits*, Hingham, MA: Kluwer-Nijhoff, forthcoming, and NBER Reprint No. 427, December 1983.

<sup>28</sup>M. L. Katz and H. S. Rosen, "Tax Analysis in an Oligopoly Model," NBER Working Paper No. 1088, March 1983.

## Business Taxation and Finance

True to its origins as the Program in Business Taxation and Finance, the tax program maintains a strong interest in issues involving the allocation of capital, including the financial structure intermediating between savers and investors. Particular topics that continue to attract Bureau research interest include the interaction between inflation and taxation, the determinants of aggregate saving, the effect of tax policy on the allocation of risk, and the influence of taxes on portfolio composition, including the characteristics of the real capital stock.

Rothschild collaborated with Daniel J. Kovenock in a careful theoretical treatment of the effect of taxes on capital gains focusing on the influence of alternative rules on the timing of harvesting an asset in its process of accruing value.<sup>29</sup> Their analysis shows how difficult it is to derive strong qualitative conclusions about this tax, even in the absence of the institutional details considered by Stiglitz in connection with effective tax rates (see note 12). Rothschild and Kovenock show, for example, that inflation may cause holding periods either to increase or to decrease in a system, such as the United States, in which gains are taxed on realization.

Research Associate Lawrence H. Summers undertook an empirical study of the relationship between inflation and the return on individual corporate securities in an attempt to understand the failure of equities to provide a good inflation hedge during the 1970s.<sup>30</sup> Relating the stock market performance of a sample of firms to characteristics of those firms (sample period, 1963-78), Summers found support for the view that higher taxes attributable to inflation-distorted measurement or corporate income could account for a substantial part of the decline in the stock market.

Summers was also the author of a contribution to the perennially controversial question of the response of aggregate savings to the rate of return. Having laid out several a priori grounds for expecting a significant positive elasticity, Summers criticizes existing empirical studies for inadequately distinguishing between permanent and transitory changes in the rate of return, and for using labor or disposable income rather than human wealth as an explanatory variable. Empirical results employing three different approaches free of these weaknesses support Summers's prima facie case for a strong response of savings to changes in the rate of return.

In other work with aggregate savings data, Slemrod finds support for the rational consumer model.<sup>31</sup> Noting that an increased threat of nuclear war shortens the

<sup>29</sup>D. J. Kovenock and M. Rothschild, "Capital Gains Taxation in an Economy with an Austrian Sector," NBER Reprint No. 421, November 1983.

<sup>30</sup>L. H. Summers, "Inflation and the Valuation of Corporate Equities," NBER Working Paper No. 824, December 1981.

<sup>31</sup>J. Slemrod, "Postwar Capital Accumulation and the Threat of Nuclear War," NBER Working Paper No. 887, May 1982.

expected horizon of individuals and firms and should therefore be expected to reduce the willingness to postpone present consumption in favor of investment, Slemrod introduces to the estimation of a standard savings function the setting of the clock, published monthly in *Bulletin of the Atomic Scientists*, that reflects the editors' judgment about the likelihood of nuclear conflict. The test indicates a large and statistically significant impact of the threat of nuclear war on private saving.

Bureau researchers also used microdata to study the process of wealth accumulation. In a neat application of techniques developed by E. E. Leamer, King and Dicks-Mireaux use data on 8297 Canadian households to examine the robustness of econometric tests of the tendency of anticipated pension benefits to displace other private saving.<sup>32</sup> While their particular emphasis is methodological, their substantive finding of a small but significant impact of pension wealth on private saving represents a useful contribution concerning this much-debated phenomenon. Harvey Rosen also used microdata, from the *Panel Study of Income Dynamics*, to estimate the influence of taxes on the accumulation by households of an often-overlooked form of wealth: human capital.<sup>33</sup> His results suggest that income taxation increases the probability of undertaking on-the-job training, presumably because of its negative influence on alternative ways to shift consumption toward the future.

Among Auerbach's contributions to the Bureau's tax research is his study of business saving.<sup>34</sup> He emphasizes that distinguishing "business" saving from other measures of wealth accumulation is rendered interesting only by institutional aspects of the tax system and the political process. For example, it seems politically possible to enact investment incentives (as distinct from general savings incentives) in the context of taxing business income but not in the context of personal taxes on financial flows.

One of the most important issues bearing on the accumulation of capital has been the subject of relatively little successful empirical research: the effect of government deficits. There has, though, been significant theoretical work in this area. Kotlikoff has been working on the problems of distinguishing "expenditure" policy and "tax" and "deficit" policy, arguing that conventional accounting concepts are seriously deficient. The challenge is to develop a standard way of expressing the effects of policy on marginal incentives, intra- and intergenerational redistribution, and direct government consumption.<sup>35</sup> In work in progress, Research Associate

<sup>32</sup>M. A. King and L. Dicks-Mireaux, "Pension Wealth and Household Savings: Tests of Robustness," NBER Working Paper No. 962, August 1982; also in *Journal of Public Economics*, forthcoming 1984.

<sup>33</sup>H. S. Rosen, "Taxation and On-the-Job Training Decisions," NBER Working Paper No. 733, August 1981.

<sup>34</sup>A. J. Auerbach, "Issues in the Measurement and Encouragement of Business Saving," NBER Reprint No. 367, May 1983.

<sup>35</sup>L. J. Kotlikoff, "The Economic Effects of Government Expenditures," NBER Working Paper No. 964, August 1982.

Michael Boskin is attempting to assemble a consistent set of data that will meet this test.

Stiglitz has pursued the theory of deficit financing, exploring the allocative effects of alternative policies in a stochastic setting. For example, he extends the well-known Barro-Ricardo proposition, emphasizing that the strong neutrality result—an increase in government debt accompanied by a decrease in lump-sum taxes has neither inflationary nor real effects—depends upon there being no redistributive effects (within or between generations). In general, public financial policies do have effects on intergenerational distribution, and Stiglitz analyzes the consequences of various specific rules.<sup>36</sup>

Several Bureau studies have been concerned with the other aspects of the allocation of risk in the economy. In a theoretical exploration of the taxation of risky assets, Auerbach shows that it may be misleading to use the expected tax rate to describe a tax rule, for example, when gains are taxed at one rate and losses are deducted at another.<sup>37</sup> Jeremy I. Bulow and Summers emphasize the difference between volatility in the earnings stream and volatility in the value of an asset.<sup>38</sup> Analyses that focus on the former type of risk are likely to understate the distorting effect of typical tax rules. The key problem is mismeasurement of depreciation; if depreciation schedules are to be set ex ante, they argue, they must be adjusted to take account of asset price risk in order to ameliorate the misallocation. Calculations intended to represent empirically relevant instances suggest that the required adjustments are large.

A number of studies have been concerned with measuring in financial market data the tax effects predicted by theory on individual portfolio composition. Building on earlier work with King, Auerbach argues that constraints on short sales, with transactions costs, lead one to expect the ownership of different firms to be concentrated within groups of similar tax characteristics, the so-called tax clientele effect.<sup>39</sup> Because of the difference between the taxation of dividends and capital gains, one ought, in particular, to be able to learn about tax-based investor clienteles from the behavior of stock prices on ex dividend days. Using data on a sample of 436 firms over a 15-year period, Auerbach finds that the evidence supports the existence of such clienteles. Using the results of this work, he goes on to test whether, as a theory based on such restrictions suggests, firms treat new share issues as a more expensive source of

<sup>36</sup>J. E. Stiglitz, "On the Relevance or Irrelevance of Public Financial Policy," NBER Working Paper No. 1057, January 1983, and "On the Relevance or Irrelevance of Public Financial Policy: Indexation, Price Rigidities, and Optimal Monetary Policy," NBER Working Paper No. 1106, April 1983.

<sup>37</sup>A. J. Auerbach, "Evaluating the Taxation of Risky Assets," NBER Working Paper No. 806, November 1981.

<sup>38</sup>J. I. Bulow and L. H. Summers, "The Taxation of Risky Assets," NBER Working Paper No. 897, June 1982.

<sup>39</sup>A. J. Auerbach, "Stockholder Tax Rates and Firm Attributes," NBER Working Paper No. 817, December 1981.

finance than new investment, and whether the composition of a firm's stockholder population influences this effect. Both hypotheses are supported by the data.

Calculations by Faculty Research Fellow George M. Constantinides, in part in collaboration with Jonathan E. Ingersoll, Jr., confirm the presumption of strong tax effects on individual portfolio management.<sup>40</sup> The U.S. rules for taxing capital gains and losses, especially the distinction between short-term and long-term capital gains, provide an incentive for individuals to realize long-term gains in order to reestablish the potential to obtain short-term treatment of any subsequent loss. The incentive is the more valuable when the variance of the asset's value is higher and the interest rate is lower. Using simulations based on actual financial market data, Constantinides and Ingersoll compare the results of active trading policies, taking advantage of this principle, with buy-and-hold strategies. The policies exploiting the tax differences are far more profitable, even when all transactions costs are taken into account.

Turning to the behavior of businesses, Research Associate Stewart C. Myers and Nicholas J. Majluf show how a firm may forgo a valuable investment opportunity rather than issue stock to finance it if managers have inside information about its value but lack the means to convey the information to stock purchasers.<sup>41</sup> In their model, firms will find it advantageous to establish a reputation for correlation between cash payouts and the quality of the existing assets as viewed by management. Perhaps their theory has some relevance to the effort by Poterba and Summers to bring evidence to bear on competing views about the effect of dividend taxes on corporate investment decisions.<sup>42</sup> According to the "new" view, investment choices should be unaffected by the rate of taxes on dividends, since the effect of investment (holding debt finance constant) is simply to alter the timing of dividends. A higher rate of dividend taxation proportionately changes the net-of-tax dividend cash flow and hence should not move an investment project from positive to negative value. This argument holds for retained earnings finance. New share issue suffers a heavier tax burden with a higher tax rate, a point stressed in the "old" view, in which higher dividend taxes reduce corporate investment. Poterba and Summers conclude from time-series data that firms behave as though investment were financed by new share issue, implying a distorting effect of dividend taxes.

Auerbach undertakes another study of the effects of taxes on business behavior in his discussion of the Economic Recovery Tax Act of 1981.<sup>43</sup> He also provides a more extended discussion of theory and empirical evidence in a survey of taxation and corporate financial policy.<sup>44</sup>

Bureau research has turned up some grounds for caution in the handling of financial market data and in drawing conclusions based upon our familiar neoclassical models. Some stock market phenomena stubbornly resist explanation under an assumption of rational behavior. Even if signaling or similar functions support the payment of dividends in spite of the tax advantages of alternative methods of distributing corporate funds, the experience of Citizens Utilities, Inc., is difficult to fathom. Citizens Utilities comes close to providing a laboratory experiment for exploring hypotheses about the effect of dividends and taxes. By a historically unique tax ruling, this firm is able to maintain two classes of common stock, differing only in that holders of one class receive cash dividends, while holders of the other receive stock dividends equivalent in value. Because of the different tax treatment of these two forms of distributions, theory predicts that ex dividend day price movement should be larger for the stock receiving cash dividends, and furthermore, that the market price of that stock should be lower. Poterba takes a close look at the behavior of Citizens Utilities stock, finding that ex dividend movement is larger for the cash-paying stock but finding no evidence of a systematically lower value.<sup>45</sup> The finding casts doubt on previous use of ex dividend evidence and keeps active the perennial puzzle about dividends and taxes.

Summers comes to even more somber conclusions in other research on the stock market. He reminds us just how difficult a task the market faces in generating "rational" values for securities with long horizons.<sup>46</sup> He argues that the strength of the evidence for financial market efficiency has been greatly exaggerated; statistical tests have insufficient discriminatory power. Since asset buyers face the same problem of identifying divergences from "rational" valuation as do academic analysts, one must reckon with the possibility that the stock market valuation may be only loosely related to such economic variables as taxes. The tax program will welcome an effective counterargument.

<sup>40</sup>G. M. Constantinides, "Optimal Stock Trading with Personal Taxes: Implications for Prices and the Abnormal January Returns," NBER Working Paper No. 1176, August 1983; and G. M. Constantinides and J. E. Ingersoll, Jr., "Optimal Bond Trading with Personal Taxes: Implications for Bond Prices and Estimated Tax Brackets and Yield Curves," NBER Working Paper No. 1184, August 1983.

<sup>41</sup>S. C. Myers and N. J. Majluf, "Stock Issues and Investment Policy When Firms Have Information That Investors Do Not Have," NBER Working Paper No. 884, April 1982.

<sup>42</sup>J. M. Poterba and L. H. Summers, "Dividend Taxes, Corporate Investment, and Q," NBER Working Paper No. 829, December 1981.

<sup>43</sup>A. J. Auerbach, "The New Economics of Accelerated Depreciation," NBER Reprint No. 377, June 1983.

<sup>44</sup>A. J. Auerbach, "Taxation, Corporate Financial Policy, and the Cost of Capital," NBER Reprint No. 442, January 1984.

<sup>45</sup>J. M. Poterba, "Interpreting Ex-Dividend Evidence: The Citizens Utilities Case Reconsidered," NBER Working Paper No. 1131, May 1983.

<sup>46</sup>L. H. Summers, "Do We Really Know That Financial Markets Are Efficient?" NBER Working Paper No. 994, September 1982.

## Other Resource Allocation Effects

Several Bureau studies concern other allocation issues. Auerbach has provided an overview of the general theory of the resource allocation effects of taxes.<sup>47</sup> His paper, prepared for inclusion in *Handbook of Public Economics* to be published in 1984 by North-Holland and edited by Auerbach and Feldstein, includes a discussion of various measures of excess burden and of the related theory of optimal taxation. Research Associate Jerry A. Hausman has also produced a survey for the *Handbook*, on the effects of taxes on labor supply.<sup>48</sup> His paper includes a discussion of theory and econometric techniques, as well as empirical results and measures of the efficiency cost of the tax system.

Among the issues singled out for treatment by Hausman is the effect of taxes on the labor force behavior of married couples. Feenberg has also contributed to this subject.<sup>49</sup> He uses TAXSIM to show the extent and distribution of the departure of the income tax from "marriage neutrality" (which would obtain if the combined tax liability of two unmarried individuals were unaffected by their marriage) in the U.S. income tax, and to explore the revenue and labor supply effects of such tax law features as the deduction of a portion of the wages of the secondary worker in a married couple.

Harvey Rosen has also prepared a survey for inclusion in the North-Holland *Handbook*. His paper concerns the effects of tax and other policies on housing decisions, stressing the methodological problems that arise in attempts to assess the efficiency and distributive implications of these programs.<sup>50</sup> He has also collaborated with Kenneth Rosen and Douglas Holtz-Eakin to study how the uncertainty of the user cost of housing (which incorporates the tax advantages of owner occupancy) affects the analysis of the rent-own decision.<sup>51</sup> Their estimation results suggest that previous work, which assumed the user cost to be known with certainty, may have overstated the effects of the income tax system on the tenure choice.

## Public Finance in Systems of Governments

Research has also been done on taxation in systems of governments, understood as encompassing both international and federal issues. Bureau Executive Director David G. Hartman has had a hand in all of the recent work in international taxation, which has focused on the mirror-image questions of the effect of

domestic and foreign tax rules on investment abroad by U.S. citizens and firms and investment in the United States by foreign citizens and firms. Hartman points out that, since most changes in domestic rules affect U.S. and foreign business taxpayers alike, there is a tendency to overlook their international allocative effect, deriving from the fact that domestic tax on foreign-source income is deferred until the income is repatriated. Since U.S. foreign investment is dominated by reinvestment of foreign income, it is virtually independent of domestic tax rule, while domestic investment is encouraged by reductions in domestic taxation.<sup>52</sup> Hartman finds the time-series evidence (1965–79) consistent with a quite strong substitution effect of reductions in domestic taxation, involving a roughly 20-cent shift away from investment abroad by U.S. taxpayers for each extra dollar of domestic investment. In a 16-country analysis of data assembled for this purpose, Hartman and Faculty Research Fellow Daniel Frisch find further support for the allocative effects predicted by theory.

In other work Hartman develops the consequences of the differences in the effects of savings and investment incentives on foreign investors in the United States that correspond to the differences in their effects on domestic taxpayers—as treated, for example, in the Auerbach–Kotlikoff research (see note 27).<sup>53</sup> A domestic savings incentive, for example, by expanding the supply of domestic savings, may reduce the return to be earned by foreigners and thus may reduce the equilibrium level of foreign investment. Again, Hartman finds the time-series evidence consistent with theoretical predictions.

Roger Gordon's work on fiscal federalism deals with problems similar to those dealt with by Hartman.<sup>54</sup> The important new dimension is residential mobility. In coming to grips with the inefficiencies that may arise in an equilibrium among fiscal jurisdictions, Gordon sacrifices institutional detail and the present prospect of econometric implementation. He gains, however, the possibility of modeling maximizing behavior of governments and a useful classification of the externalities that one unit of government may create for nonresidents, through both its expenditure and its tax policies.

In Gordon's world, governments are assumed to ignore migration consequences of changes in their policies. Stiglitz has provided an analysis of equilibrium in a model in which communities correctly perceive their influence on migration and in fact seek to take advantage of it.<sup>55</sup> He proves that in such a world of "perfect community competition" equilibrium is highly determinate and efficient. This result makes precise a famous

<sup>47</sup>A. J. Auerbach, "The Theory of Excess Burden and Optimal Taxation," NBER Working Paper No. 1025, November 1982.

<sup>48</sup>J. A. Hausman, "Taxes and Labor Supply," NBER Working Paper No. 1102, March 1983.

<sup>49</sup>D. Feenberg, "The Tax Treatment of Married Couples and the 1981 Tax Law," NBER Reprint No. 423, October 1983.

<sup>50</sup>H. S. Rosen, "Housing Subsidies: Effects on Housing Decisions, Efficiency, and Equity," NBER Working Paper No. 1161, June 1983.

<sup>51</sup>H. S. Rosen, K. T. Rosen, and D. Holtz-Eakin, "Housing Tenure, Uncertainty, and Taxation," NBER Working Paper No. 1168, July 1983.

<sup>52</sup>D. G. Hartman, "Domestic Tax Policy and Foreign Investment: Some Evidence," NBER Working Paper No. 784, October 1981.

<sup>53</sup>D. G. Hartman, "Tax Policy and Foreign Direct Investment in the United States," NBER Working Paper No. 967, August 1982.

<sup>54</sup>R. H. Gordon, "An Optimal Taxation Approach to Fiscal Federalism," NBER Working Paper No. 1004, October 1982.

<sup>55</sup>J. E. Stiglitz, "Public Goods in Open Economies with Heterogeneous Individuals," NBER Working Paper No. 802, November 1981.

proposition by Charles Tiebout.<sup>56</sup> The conditions for perfect community equilibrium are rather stringent, however, and in a conference paper that takes stock of the status of Tiebout's idea, Stiglitz shows how the "market" failures in this context are related to policy issues concerning urban concentration, fiscal decentralization, and regional redistribution.<sup>57</sup>

Charles E. McLure, Jr., brings a totally different perspective to the subject of taxation in a federation, specifically the United States. In two papers he explores the relevance of economic arguments to important legal doctrines. One is the matter of the constitutionality of taxes levied by states, when the taxes in question are borne in substantial measure by residents of other states—an externality that may have mischievous consequences as stressed by Gordon.<sup>58</sup> McLure casts doubt on the feasibility of basing constitutionality on economic incidence analysis—"tax exporting" is the term of art—in view of the pace of economic and institutional change and the difficulty of correctly formulating the incidence issue to be determined. In tax institutions one often encounters rules making purported economic distinctions that economists are hard pressed to understand. One instance is the notion of "unitary business," used by states to determine the applicability of corporation income tax. McLure attempts to help the lawyers out in his second paper, which develops a three-part test for a unitary business, based on economic analysis.

<sup>56</sup>The original contribution appears in C. Tiebout, "Pure Theory of Local Expenditures," *Journal of Political Economy* 64, 1956, pp. 416-424.

<sup>57</sup>J. E. Stiglitz, "The Theory of Local Public Goods Twenty-Five Years after Tiebout: A Perspective," *NBER Working Paper No. 954*, August 1982. This paper was presented at a conference organized at Rice University by George Zodrow.

<sup>58</sup>C. E. McLure, Jr., "Tax Exporting and the Commerce Clause: Reflections on Commonwealth Edison," *NBER Reprint No. 392*, July 1983.

## Research Summaries

### Correction

In the Fall 1983 *NBER Reporter*, an error in layout inadvertently transposed some paragraphs of the research summary, "Minority Youth Unemployment," by Richard B. Freeman. We reprint the article below in its correct sequence.

## Minority Youth Unemployment

Richard B. Freeman

The youth unemployment project has a particularly interesting history. The Bureau completed a youth employment study, resulting in a book edited by David A. Wise and Richard B. Freeman that was published by the University of Chicago Press in 1982. In that study two or three aspects of the youth unemployment program were striking: first, the employment-to-population ratio had fallen very sharply for black youths in the 1970s, but not for white youths. In one sense, the youth unemployment problem that other countries were experiencing at that time was concentrated among young blacks in the United States. As a result of the decline in employment to population among blacks, the figures for the late 1970s showed enormous racial differences, far exceeding those in earlier decades.

The second finding was that government information, in particular the Current Population Survey (CPS), was inadequate for understanding the problem. Basically, the CPS asks, "Are you working?" If you are not working, you are classified as unemployed or out of the labor force, two states about which little additional information is gathered. NBER labor economists thought that what these jobless youths were doing, not what they were *not* doing, would yield a clue to the problem.

In the government survey, there is also a lack of information on certain alternatives to work that may be quite important to these youths. The major alternative is crime, broadly defined to include certain kinds of illegal activities (nonviolent) but not others.

NBER developed a set of questions to ask inner-city minority youths and went to Mathematica, Inc., for a survey using this questionnaire. There was great concern about getting a reasonable response, but over 2000 youths from the worst poverty tracts in three U.S. cities did respond; that represented about an 80 percent response rate.

NBER asked a set of innovative questions about the daily activity of these youths, their desire to work, their use of drugs, illegal activities, and their perceptions of the market. One set of questions had to do with willingness to work: "Well, really, how willing are you to take a job at different levels of pay?"; and "Would you take a full-time job right now, if it were as a laborer in a factory at \$2.50 an hour?" If yes, the interviewer went on to the next question. If no, the interviewer raised the hypothetical wage to \$3.50 an hour and then to \$5.00 an hour. This was an effort to get at the reservation wage of these young people. One problem with the official government statistics included in the CPS is that this question was never asked; you never know at what wage the unemployed would take a job.

A second set of questions in the NBER survey dealt with some of the illegal things that the youths may have done over the past 12 months. A fair number of young people reported crimes; approximately one-quarter of the total income in the sample came from illegal activities. Even this may understate the amount of crime committed.

A third question focused on what the youths did in a typical day. Did they spend their time fruitfully or not?

In general, the survey appears to have correctly identified young persons facing the most severe economic problems. The inner-city youth in the NBER survey, compared to all black youth from the National Longitudinal Survey of young people, and all white youth, were much more likely to be unemployed or much less likely to be employed. They tended to have slightly lower wages than other youths and they worked fewer weeks. Sixteen percent of them reported crimes; 26 percent reported drug use beyond marijuana; 20 percent reported alcohol use. Only 17 percent of their time was spent on anything that could be considered socially useful. The bulk of it was spent on either TV, movies, music, or the like; that is, leisure.

These kids also had far worse family backgrounds than other kids. One-third of them live in public housing, and almost one-half of them have a family member on welfare. Only 28 percent of them have a man in their household; only 41 percent have a family member working or in school, compared with 71 percent for white youths of the same age. That, it turns out, is a key variable, because people with someone in the family working are more likely to be working themselves than those who don't have someone else in the family holding down a job.

The questionnaire also asked why those youths who had had jobs left their last job. The striking result was the discharge rate. Typically, discharge rates are very low: people rarely get fired; most often they get laid off or they quit. These youths got fired.

To ascertain perceived opportunities from crime the survey asked, "Do you think you can make more on the street, or in a legitimate job?" One-third of these youths said they thought they could make more on the street, although "on the street" was not defined as particularly legal or illegal.

Finally, the interviewer asked, "How easy would it be for you to find a job if you went out tomorrow and really looked?" Close to one-half of the youths thought it would be very or somewhat easy to find a job as a laborer. Almost two-thirds of them thought it would be easy to find a job at the minimum wage.

The major results of the NBER project can be summarized in 12 statements. The first result, and in some ways the most surprising, is a finding that cities with a high female proportion of the work force had the worst labor markets for young blacks. Both wages and labor participation rates were lower for blacks in those cities. The interpretation put on this was that the rise in female participation rates in this country has really hurt the job opportunities for these blacks. Women coming into the job market go into the same entry-level jobs; otherwise, these jobs might have been filled by young blacks. This is now being checked with time-series data, and with the 1980 census data, in an effort to test the sturdiness of the result. But as it stands, it looks as though a high female participation rate is harmful to job opportunities for young blacks.

Second, as part of the NBER project, kids graduating or about to graduate from high school in Newark, New Jersey—some white and some black—were sent out, being told, "Here's a list of jobs that we've identified; go and see what happens. We'll pay you to come back and report to us what happens when you apply for these jobs." This was an effort to get some information from employers. It was very difficult finding white youths to participate; black youths were much more eager to go through this process. One conclusion from this was that white youths have much better links to the job market. However, it became apparent that both white and black youths were what is called "reference poor." They'd fill out forms that asked, "Who do you give as a reference for yourself?" and they would list their friends at school. They wouldn't report teachers or previous employers; this was true for both black and white youths.

This auditing experiment provided two types of results: one presented the nature of the job market as these youths saw it; the other indicated that the black auditors were treated less courteously, in some respects, than the white auditors. For example, people were less likely to call them "Sir."

A third finding from the survey had to do with absenteeism: the fact that many of these inner-city black youths were fired from their last job is highly linked to the fact that they reported themselves as being absent quite a bit. Most companies have some rule that says that if you're absent a certain number of times during a probationary period, you're out. The absence rate for these kids was on the order of one-and-a-half times that of comparable whites. So there was clearly a job performance problem with these youths. Even so, another of the studies reported that differences in layoff rates were not the prime cause of differences in unemployment patterns.

In spite of all the problems in the quality of education in the inner city, the project found that staying in school longer was beneficial for these kids. Those who stayed

in school longer clearly had better employment records. There was also some evidence that post-school training helped them.

One of the major findings in this project may be called "race, not space." This result comes largely from a detailed study of Chicago. In the Chicago area, there are basically two clusterings of blacks, on the west side and on the south side. There are many factories and jobs on the west side; the south side is mostly residential. On the basis of proximity to work, one would think that those youths on the south side would have a much worse employment experience than those on the west side, close to jobs. But there turns out to be very little difference between them. Moreover, if you look only at the borderline between where the blacks and the whites live on the west side, you find that the white kids get jobs. The conclusion here is that the problem facing these black youths is not one of lack of jobs in their area; even when the jobs *are* in their areas, the white youths still get them. This has a policy implication for how successful cities would be if they ever went to some sort of enterprise zone scheme; a lot of the employers might just bring in white youths from elsewhere in the city.

The sixth finding is that a lot of the black youths' unemployment has to do with the fact that they are out of work for very long periods of time and, once nonemployed, they have great difficulty getting a job again. They have short-term jobs followed by long, extended spells when they are out of the work force. Twenty percent of the kids may not be employed for over a year. When they are not employed, moreover, they appear to do little to raise their work skills for employers. Also, those who reported that they could make more on the street were out of work the most. That can be interpreted as a supply response to this alternative possibility.

NBER researchers also went to employers and asked them, "How big a strike is it against a youth if he does have a bad work history?" The employers reported that they were greatly concerned about these youths who held a job for a short time and then left, either because they were absent a lot and got fired or because they quit the job. Employers were looking for steady workers.

With respect to reservation wages, one study found that blacks answer questions about wages very similarly to comparable white youths. Their occupational goals are similar to those of the whites. Since there are some differences in their possibilities of getting jobs, and there are some differences in the wages at which they *do* get jobs, about 30 percent of the longer period that blacks are out of employment can be explained by the fact that they maintain relatively high reservation wages. Black youth should not necessarily lower their expectations, nor should they take lower wages than white youths, which would be illegal discrimination by the employer. But the fact that they don't make any adjustments in their wage expectations contributes to joblessness.

Among the more positive findings, the NBER project found that churchgoing and "right attitudes" help. The youths were asked whether they attend church and whether they were members of church groups. One

idea was that the church (a major social institution in the black community) must be doing things that will help these youths advance in society. Another hypothesis was that youths with the "right" outlook might be doing better than others. Churchgoing turned out to be a significant factor. The youths who went to church behaved differently from those who did not report themselves going to church. Independent of that, the youths who believed that hard work leads to success were, in fact, succeeding. But does one interpret these results as the role of the church as a social institution helping youth, or of attitudes causing behavior? Or is it that "good kids" go to church, get jobs, stay in school, don't commit crimes, and have the right attitudes? NBER researchers have done some statistical tests and used efforts to probe this; their conclusion is that these attitudes and churchgoing in fact reflect something more than a sorting of kids by "good" and "bad."

Another finding also got a lot of headlines: the role of crime. People were asked their perception of whether they they would get caught for committing a crime; and if so, would they be convicted? If convicted, would they go to jail? The finding was that, indeed, these youths' perceptions of riskiness and rewards of crime are a major factor in whether they choose a legitimate job or crime. The youths who perceived that the chances to make money illegally were pretty good tended to commit crimes. They tended not to be employed, not to be in school, not to spend their time productively, and the elasticities of supply between crimes and legal activities were fairly significant.

That result is striking, given the crime literature. Most studies of the trade-off between unemployment and crime have found very modest linkages. These studies were done on aggregate data for crime rates and unemployment rates. But the NBER work focuses on a very criminally prone group and on their personal opportunities to engage in crime versus work. It really yielded a much stronger result than has the aggregate work in the past.

The tenth finding was that if you compare people in welfare homes, given the same family income and the same other attributes as people in *nonwelfare* homes, the kids in welfare homes do much worse. If there were a natural reduction of the fraction of families on welfare, then the odds are that the youths would benefit as well as the rest of their families.

An additional finding is that as youths age, their employment rises but *not* very rapidly. The problem of inner-city young black male joblessness is not going to disappear simply because of aging. High jobless rates seem likely to plague this group well into their late twenties and thirties.

The twelfth and final finding is that the supply of black youths is very responsive to incentives and opportunities to work or engage in other activities. If the market situation basically is bad and the youths see crime as a high-paying, low-hours-of-work alternative, they respond to this significantly. This suggests that if the

reverse were true and there were job opportunities available, or incentives to staying in school, the youths would respond positively and significantly.

## Recent Developments in U.S. Corporate Taxation

Alan J. Auerbach

An unmistakable trend in postwar American tax policy has been the declining importance of the corporate income tax as a source of federal revenue. Starting from roughly 28 percent of federal receipts during the mid-1950s, corporate tax collections have fallen to about 8 percent currently.<sup>1</sup> Part of this drop reflects the decline in corporate profitability, and, with the increase in nominal interest rates, a rise in the fraction of corporate capital's total return absorbed by tax-deductible interest payments. Even as a percentage of adjusted corporate profits, however, tax revenues have declined by about one-third over this period. Only part of this decline is directly attributable to reductions in the statutory rate (which fell from 52 percent to 46 percent). The rest is caused by the increasing value of investment incentives, embodied in the investment tax credit and the acceleration of depreciation allowances beyond those corresponding to economic depreciation. The most recent such tax reduction came about with the passage of the Economic Recovery Tax Act of 1981 (ERTA), which, through the Accelerated Cost Recovery System (ACRS), allowed equipment to be written off over three or five years and structures over fifteen years. Combined with the investment tax credit, this gave equipment a negative tax rate: a negative present value of taxes.<sup>2</sup> Even with the reduction in allowances legislated by the Tax Equity and Fiscal Responsibility Act of 1982 (TEFRA), tax rates on new equipment remain near zero.<sup>3</sup>

A tax system such as the current one cannot be analyzed by examining average tax rates. Because of accelerated depreciation allowances and the investment tax credit, an asset typically receives deductions and

credits that are more than sufficient to shelter all income associated with it in the years immediately after purchase but faces a tax base exceeding economic income in later years. Hence, even without changes in the tax law, average tax rates on current income depend on the age distribution of assets, with fast-growing firms having lower average tax rates.

This characteristic of the tax system also increases the importance of another: the fact that tax losses are not fully refundable. Net operating losses qualify for a tax refund only to the extent of the sum of the firm's three previous years' taxable income. Otherwise, they must be carried forward, for possible use in offsetting future gains. The carrying forward of losses is less attractive than an immediate refund, since the unused losses do not receive any interest and are not indexed for inflation. Since fast-growing firms are more likely to have negative taxable income, even if they are earning a positive economic return this asymmetry in the tax codes appears to penalize them, relative to established firms.

Finally, the process of accelerating depreciation allowances, culminating in 1981, has led to a great deal of variation in the marginal tax rates faced by investors according to their choice of assets. This is not discernible from aggregate statistics. Much of my recent research has been aimed at studying the economic effects of these and other aspects of the U.S. corporate tax.

One normally associates a reduction in marginal tax rates with an increase in economic efficiency, but the tax cut introduced by ACRS may actually have worsened the allocation of capital within the corporate sector. In particular, it widened the gap between the taxation of structures and of equipment. Combined with the reduction in the number of asset classes, this increased the variation in tax rates so that, by one measure, the fraction of the corporate capital stock "wasted" by inefficient allocation actually increased between 1980 and 1981.<sup>4</sup> While some have suggested that the tax penalty facing structures is actually smaller, because investment in structures may permit investors to take greater advantage of debt finance and the associated benefit of interest deductibility, I was not able to find evidence of this in a study of the relationship between the financial and asset mixes of a cross-section of major American corporations.<sup>5</sup>

In attempting to understand why the U.S. tax system, like those systems in most countries, does not allow a tax refund for losses, or, at least, an opportunity to earn the nominal interest rate on losses carried forward, some have suggested that the lack of loss offset acts as a penalty tax on poorly managed firms, while the carry-

<sup>1</sup>Historical statistics on corporate revenues and effective tax rates are presented in A. J. Auerbach, "Corporate Taxation in the United States," *Brookings Papers on Economic Activity* 1983:2, forthcoming.

<sup>2</sup>See A. J. Auerbach, "The New Economics of Accelerated Depreciation," *Boston College Law Review* 23, 5, September 1982, pp. 1327-1355, and NBER Reprint No. 377, June 1983, for a detailed analysis of the provisions of ACRS.

<sup>3</sup>See Auerbach, "Corporate Taxation in the United States."

<sup>4</sup>Ibid.

<sup>5</sup>A. J. Auerbach, "Real Determinants of Corporate Leverage," NBER Working Paper No. 1151, June 1983, and in B. M. Friedman, ed., *Corporate Capital Structures in the United States*, Chicago: University of Chicago Press, forthcoming.

forward provision exacts only a small tax from high-risk, high-return operations that suffer the occasional loss. Unfortunately, this argument ignores several important points. First, it is not clear that government should play a role in the identification of the ability of management. Second, while the poorly managed firms, or "losers," may be more likely to incur a loss in the future, they are also more likely to have a tax loss carried forward from the past. The shield provided against future taxable income may stimulate investment, thus offsetting the penalty on future losses. Finally, measuring a firm's quality by its taxable income makes little sense when, as discussed above, the firm's tax base depends not only on its rate of return but also on its growth rate. With accelerated depreciation, firms may incur losses because of a low economic return to capital or because of a high rate of investment. These are clearly two different types of firms.

In response to this last problem in particular, ERTA also included liberalized leasing provisions. The new creation, "safe harbor" leasing, was a vehicle by which one firm, presumably with positive tax liability, could purchase another firm's investment-related tax benefits in exchange for an immediate "down payment" and future transfers of tax liability.<sup>6</sup> If it were possible for a firm to sell all its losses in this way, the result would be equivalent to a system with full loss offset. However, given the limitation to the rate of deductions and credits generated by new investment, some firms were able to sell their deductions while retaining such a large residual of tax losses that their income would not be taxable for several years. While such a subsidy may have fallen short of that enjoyed by fully taxable firms taking advantage of the interest deduction, the difficulty of neutralizing the tax system's underlying asymmetry through this type of partial correction is clear. Only by chance would firms with different tax positions face the same incentive to invest.<sup>7</sup> For reasons probably unrelated to this, Congress repealed safe harbor leasing with the passage of TEFRA, replacing it with a hybrid of pre-1981 and post-1981 leasing, called "finance" leasing by the legislation.<sup>8</sup>

Ultimately, the theoretical effects on investment of this asymmetry in the treatment of gains and losses are complicated, depending on the tax system, the current condition of the firm, the characteristics of the investment, and the likelihood that the firm's tax status will change in the future. In general, there is not a simple increasing or decreasing relationship between the size

of a firm's initial tax loss carryforward and its incentive to invest.<sup>9</sup> Empirically, however, it appears that a firm with a higher loss carryforward faces a higher effective tax rate on its investments.

This conclusion comes from an analysis based on observations of the tax loss carryforwards of a cross-section of U.S. corporations over time. Using this panel, I estimated the probabilities of transition from being taxable (having no loss carryforward) to being nontaxable (having a loss carryforward) in the next period, and vice-versa.<sup>10</sup> With these probabilities, we can solve for the expected present value of tax payments associated with an investment, allowing for the possibility that some tax liabilities may be deferred should the firm become nontaxable. Normally, deferral of taxes reduces the tax burden on investment. For firms with a high initial loss carryforward, however, the greatest expected deferral applies to near-term tax liabilities, before the firm has had the opportunity to "work its way out" of its nontaxable status. Since these tax liabilities are negative, especially for equipment, this additional deferral raises the present value of tax payments.

In noting the difference between average and marginal corporate tax rates caused by accelerated depreciation, we may make an inference concerning the relative valuation of old and new assets. As discussed above, the income of old assets is taxed more heavily, since they have less of a future tax shield from depreciation allowances. In addition, changes in the tax law liberalizing depreciation allowances typically have not been retroactive, thus introducing a further difference. As depreciation schedules have become more accelerated over time, the gap between old and new assets has increased. According to my calculations,<sup>11</sup> one would expect this effect alone to reduce the value of Tobin's  $q$ , the ratio of market value to replacement cost, for the corporate capital stock to below 0.8.<sup>12</sup>

This decline in  $q$  would not have occurred had the same steady reduction in effective corporate tax rates been through statutory rate reductions, for then the relative values of old and new assets would not have changed. One may view the actual policies as having combined the effect of such general rate reductions with one-time, offsetting-wealth levies on the existing capital stock. Aside from the familiar result that this leads to a greater "bang for the buck" because of the reduction in revenue loss, the implicit wealth levy may, through the induced decline in asset values, further

<sup>6</sup>The leasing provisions are described in more detail in Auerbach, "The New Economics of Accelerated Depreciation," and A. C. Warren, Jr., and A. J. Auerbach, "Transferability of Tax Incentives and the Fiction of Safe Harbor Leasing," *Harvard Law Review* 95, 8, June 1982, pp. 1752-1786, and NBER Reprint No. 341, December 1982.

<sup>7</sup>See Warren and Auerbach, "Transferability of Tax Incentives and the Fiction of Safe Harbor Leasing."

<sup>8</sup>The new rules are discussed and analyzed in A. C. Warren, Jr., and A. J. Auerbach, "Tax Policy and Equipment Leasing after TEFRA," *Harvard Law Review*, May 1983.

<sup>9</sup>This is shown in A. J. Auerbach, "The Dynamic Effects of Tax Law Asymmetries," NBER Working Paper No. 1152, June 1983.

<sup>10</sup>See Auerbach, "Corporate Taxation in the United States."

<sup>11</sup>Ibid.

<sup>12</sup>This undervaluation would be in addition to that potentially associated with the equilibrium response of firms to the taxation of dividends. A comparison of these two effects is presented in A. J. Auerbach, "Taxation, Corporate Financial Policy, and the Cost of Capital," *Journal of Economic Literature*, September 1983, pp. 905-940, and NBER Reprint No. 442, January 1984.

stimulate saving via a reduction in the wealth of those with a relatively high marginal propensity to consume. Indeed, theoretically, so much saving could be generated that the tax incentive would be self-financing.<sup>13</sup>

To the extent that marginal corporate tax rates are, in the aggregate, close to zero, the present corporate tax may be thought of as consisting of two components. One is the inframarginal, nondistortionary tax on the income from existing assets, its present value equal to the extent of the capital stock's undervaluation. The second is the complex system of marginal distortions to the incentive to invest, among assets and among firms, as detailed above, that raises little revenue. These systems may be logically separated, for it would be possible, as under the corporate cash flow discussed by the Meade Committee<sup>14</sup> and others (with a full loss offset), to remove the latter without disturbing the former. Much of the future research concerning reform of the corporate tax will undoubtedly focus on this distinction.

<sup>13</sup>A. J. Auerbach and L. J. Kotlikoff, "Investment versus Savings Incentives: The Size of the Bang for the Buck and the Potential for Self-Financing Business Tax Cuts," in L. H. Meyer, ed., *The Economic Consequences for Government Deficits*, Hingham, MA: Kluwer-Nijhoff, forthcoming, and NBER Reprint No. 427, December 1983.

<sup>14</sup>Institute for Fiscal Studies, *The Structure and Reform of Direct Taxation*, 1978.

1. Changes in the growth rate of money affect the growth rate of nominal income.
2. Instability in the growth rate of money is associated with instability in the growth of nominal income.
3. Long-run changes in the growth rate of money relative to growth in output determine the long-run behavior of prices while short-run changes in the growth rate of money are an important element in the ordinary business cycle.
4. A sustained change in the growth rate of money tends to be followed by a change in the inflation rate in the same direction after a lag of 1½ to 2 years.
5. Short-run changes in the growth rate of money tend to be followed by changes in the same direction in real output after a lag of six to nine months.
6. Substantial contractions in the growth rate of money over short periods have been a major factor in producing severe economic contractions.
7. Bank failures are vastly more serious as a mechanism through which a decline is produced in the stock of money than in imposing capital losses on their stockholders. A radical change in the deposit-currency ratio as a result of runs on banks should be countered by the monetary authorities by an increase in high-powered money. Deposit insurance, however, may eliminate the need to rely on such a response.
8. The foregoing relationships persisted before as well as after the Federal Reserve System was established and under both gold standard and fiat money regimes.
9. The Federal Reserve can produce whatever growth rate of the quantity of money that it chooses.

Monetary experiences since 1963 seem to us to confirm our earlier findings. The quantity of money roughly tripled after 1963 and so did the consumer price index. Moreover, as the long-run rate of monetary growth declined between 1979 and 1982, so did the inflation rate. Between 1963 and 1983, stop-and-go movements in monetary growth were matched by recessions and recovery periods that followed. Since 1979 the increase in the variability of monetary growth has been matched by an increase in the variability of interest rates and economic activity.

Our findings were regarded as controversial when first reported<sup>2</sup> but gained a degree of acceptance as the academic community that had largely ignored the role of money began to acknowledge that it mattered. In recent years, however, controversy about monetary issues has flared. Changes in institutions fostered by an inflationary environment have raised questions about what is money and whether, and how, it can be or should be controlled. The influence of the managed floating exchange rate system on domestic monetary control is another area of dispute. More far-reaching

<sup>2</sup>See the comments by H. P. Minsky and A. M. Okun in the *Review of Economics and Statistics*, cited in note 1, pp. 64-77; and J. Tobin, "The Monetary Interpretation of History," *American Economic Review* 55, June 1965, pp. 465-485.

## Monetary Issues

Anna J. Schwartz

Twenty years ago Milton Friedman and I, in our first book and article, reported our findings on the relations between money and other economic variables based on monetary experiences in the United States from 1867 to 1960.<sup>1</sup> Those findings supported the conclusion that changes in the quantity of money have important and broadly predictable economic effects, namely:

<sup>1</sup>A Monetary History of the United States, 1867-1960, Princeton: Princeton University Press (for NBER), 1963; "Money and Business Cycles," *Review of Economics and Statistics* 45, 1 (part 2), supplement, February 1963, pp. 32-64. Two other books Milton Friedman and I wrote are: *Monetary Statistics in the United States: Estimates, Sources, Methods*, New York: National Bureau of Economic Research, 1970, and *Monetary Trends in the United States and the United Kingdom: Their Relation to Income, Prices, and Interest Rates, 1867-1975*, Chicago: University of Chicago Press (for NBER), 1982.

changes in the monetary system that some see in prospect are the subject of discussion. Deregulation of banks has suggested to some observers the need for a reconsideration of the existing federal deposit insurance system. International debt problems confronting the banks of the major industrialized countries are another set of issues for which differing solutions have been proposed.

In what follows I comment on each of these issues and the controversy surrounding it.

## What Is Money?

The definition of money that Milton Friedman and I used in our studies was: the sum of currency held by the public plus adjusted deposits of commercial banks, both demand and time. We chose this broad definition not on principle but because it was useful in organizing our knowledge of economic relationships. In our view, holders of money regarded the three components as providing the same services over the period we studied. However, we made one modification beginning in January 1961 when we excluded large negotiable certificates of deposit (held mainly by business firms and other large investors) from total commercial bank deposits on the ground that the remainder was more homogeneous with the earlier total of commercial bank deposits than the total itself.

In the aftermath of inflationary pressures that gathered strength in the 1970s, the gradual lifting of ceilings on interest payable on time deposits beginning in the 1950s culminated in 1983 with the virtual elimination of all interest restrictions. Correspondingly, the prohibition of payment of interest on demand deposits was progressively weakened with the spread to the whole country and all institutions of new forms of checkable deposits including NOW, ATS, and Super NOW accounts. Currently, the Federal Reserve definition of narrow money (formerly, currency plus demand deposits at commercial banks) includes currency, travelers' checks, noninterest-bearing demand deposits, NOW, ATS, and Super NOW accounts, credit union shares, and demand deposits at mutual savings banks. This definition seems continuous with the definition that Milton Friedman and I used in our studies. A broader definition also includes savings and small-denomination time deposits at commercial banks and thrift institutions, 6-month money market certificates, money market mutual fund shares, money market deposit accounts, and overnight repurchase agreements, plus overnight Eurodollars held by U.S. residents other than banks at Caribbean branches of member banks. This definition seems continuous with the broadest of the four definitions in *Monetary Statistics of the United States*.

The new instruments all represent adjustments to a transition from regulatory control of interest payments on deposits to an unregulated market determination of those payments. The transition period is likely near its end. Those who allege that it is no longer possible to

identify the assets commonly used as money may well have made a hasty judgment. One example of such haste was the view that the spread of deposit sweeping would lead to serious underestimation of money holdings.<sup>3</sup> With deposit accounts free of interest rate restrictions, little incentive now remains to hold sweep accounts.

The specific instruments in the definition of money have changed historically. Yet, whatever the instruments, the services of money have always been identifiable. To determine whether a discontinuity exists between the behavior of former and current definitions of money, a longer data base for the current definition will first have to be available.

## Can Money Growth Be Controlled?

The repeated failure of the Federal Reserve to achieve its announced money target growth rates has led some observers to conclude that control is not possible. The usual argument for this view is that money demand is unstable. The Federal Reserve indeed interprets changes in money growth as caused by shifts in money demand that it should accommodate. Failure to accommodate demand disturbances, in this interpretation, would intensify instability of interest rates. Hence the Fed focuses on movements in the federal funds rate rather than seeking to achieve stable growth in unborrowed reserves—its announced instrument for controlling money growth.

A variant of the view that demand shifts dominate domestic money growth has been advanced in the context of the floating exchange rate system. The argument is that under these arrangements no single country can control its own domestic money supply. Holders of domestic money will shift into or out of foreign money if prospective exchange rate movements of foreign interest rates make it attractive to do so, frustrating domestic monetary authority actions.<sup>4</sup>

The counterargument to the explanation of unstable money supply by appealing to unstable money demand, first in the domestic context, is that deviations of monetary growth from the targets occur because of the Federal Reserve's own procedures. The procedures in question are: manipulating the federal funds rate; lagged reserve accounting; the Federal Reserve's decision to target unborrowed reserves, leaving borrowed reserves essentially uncontrolled in the absence of a penalty discount rate; and nonpayment of interest on reserves of the banks at the Federal Reserve.

In the international context, the counterargument to the explanation of unstable money supply by appealing to unstable money demand is that monetary au-

<sup>3</sup>F. E. Morris, "Do the Monetary Aggregates Have a Future as Targets of Federal Reserve Policy?" *New England Economic Review*, March/April 1982, pp. 5-14.

<sup>4</sup>R. I. McKinnon, "Currency Substitution and Instability in the World Dollar Standard," *American Economic Review* 72, June 1982, pp. 321-333.

thorities who intervene in foreign exchange markets and use an interest rate as the instrument to achieve domestic money targets may lose control over the supply. Purchases of foreign exchange, if not sterilized, expand reserves; sales, if not sterilized, reduce reserves. Unstable money may be the consequence of supply rather than demand disturbances.

The situation for control may, however, shortly improve with the introduction in February 1984 of contemporaneous reserve accounting, the prospective equalization of required reserve ratios on all checking account deposits, freeing of most nonchecking account deposits from reserve requirements, and minimizing float. Contemporaneous, uniform, and universal reserve requirements on the components of the current narrow money definition should minimize deviation from targets. Other reforms, including targeting total reserves or the monetary base, a penalty discount rate, and interest payments on bank reserves at the Federal Reserve are still not in prospect. It remains to be seen whether the Federal Reserve will seize the opportunity to improve its control.

## How Should Money Growth Be Controlled?

For most of the postwar period the Federal Reserve has used an interest rate as an indicator of the change in money growth that was needed. The aim of open market operations was to keep the interest rate at some predetermined level that was thought to be consistent with the objective of money growth. Additional reserves were provided to the banking system when the interest rate was subject to upward pressure and reserves were withdrawn when the interest rate would otherwise have fallen. With accelerating inflation, the level of interest rates became an unreliable measure of reserve adequacy. The Federal Reserve announced that it was modifying this procedure in October 1979 by directly setting a path for the supply of reserves.

Disenchantment with the way the Federal Reserve has conducted its operations since October 1979 has led some economists to advocate a variety of indicators for objectives of money growth. One is a credit aggregate.<sup>5</sup> The argument for its use is that it approximates nominal GNP, and although the Federal Reserve cannot itself control total credit, its movements would be useful as an indicator for monetary policy. It is not clear, however, why the aggregate would be superior to nominal GNP itself, if one seeks such a guide for monetary policy. Still other indicators for changing the growth rate of money have been suggested: the foreign exchange rate of the dollar or the price of gold.<sup>6</sup> A rise in the foreign exchange value of the dollar, in this view,

represents inappropriate tightness of money growth; a decline, inappropriate looseness of monetary growth. Similarly, a rise in the price of gold is said to indicate too expansionary monetary growth; a decline, too contractionary monetary growth. A rise in the exchange rate may, however, be consistent with rapid monetary growth in the domestic country, but still higher monetary growth abroad; a decline may be consistent with rapid monetary growth in the domestic country, but lower monetary growth abroad. Similarly, changes in the gold price may reflect conditions in the gold market and expectations of inflation unrelated to monetary growth.

## Should Money Growth Be Controlled?

Control of money growth is not an end in itself. Its economic effects are the reason for seeking to control its growth. A widely held opinion since the mid-1970s is that a breakdown has occurred in the relationship between money growth, spending, and inflation. It is alleged that the ratio of GNP to the money stock has become unstable and unpredictable. Therefore control of money growth has lost its rationale. Alternatively, some regard a money target as unsatisfactory since it does not give specific content to the ultimate goals of monetary policy. Both sets of critics of monetary targets therefore propose that monetary authorities instead should attempt to stabilize directly nominal or real interest rates, credit aggregates, nominal or real GNP, or the price level.

Research on the stability of the demand function for money since the 1970s is not unanimous in finding a shift.<sup>7</sup> Even if it were demonstrable beyond a doubt that velocity has become unstable and unpredictable, the conclusion would not be that the Federal Reserve should attempt to offset velocity movements. Federal Reserve attempts at offsetting changes in money growth rates, given unpredictable velocity movements, would only exacerbate cyclical developments. In fact, changes in money growth rates themselves affect velocity, sudden expansions tending to depress velocity, sudden contractions to stimulate velocity.

The Federal Reserve can directly control only items on its own balance sheet. Those who urge the Federal Reserve to do nothing but smooth interest rate fluctuations court the danger of explosive monetary growth or excessive monetary contraction. The proposals that support either ignoring monetary targets or associating them with ultimate goals assume a directly observable effect, without a lag, of a change initiated by the

<sup>5</sup>B. M. Friedman, "The Roles of Money and Credit in Macroeconomic Analysis," NBER Working Paper No. 831, December 1981.

<sup>6</sup>R. T. Mundell, "International Monetary Options," *The Cato Journal* 3, 1, Spring 1983, pp. 189-210.

<sup>7</sup>See S. M. Goldfeld, "The Demand for Money Revisited," *Brookings Papers on Economic Activity* 3, 1973, pp. 683-730; J. Wenniger, L. Radecki, and E. Hammond, "Recent Instability in the Demand for Money," *Federal Reserve Bank of New York Quarterly Review, Summer 1981*, pp. 1-9; S. Hein, "Short-Run Money Growth Volatility: Evidence of Misbehaving Money Demand?" *Federal Reserve Bank of St. Louis Review* 64, June/July 1982, pp. 27-36.

Federal Reserve. According to some proposals, the Federal Reserve would be instructed to increase interest rates by a certain amount whenever a price index exceeded a given target or the unemployment rate fell below a certain level, or the growth rate of nominal or real GNP rose above a predetermined path. There are two problems with these proposals. First, they are backward-looking. The undesired change in prices, the unemployment rate, or nominal or real GNP occurred because of earlier change in money growth. The interest rate response to the undesired effects is belated. Second, the proposals are exceedingly ambitious. They take for granted that economists know the precise quantitative change in interest rates that is required and the time lags that intervene between the change and the desired effect, and that they also can determine whether an observed effect is related to the change or to some independent influence.

A more radical response than any of the foregoing proposals to the record of procyclical and long-run inflationary bias in the growth rate of money since the mid-1960s would substitute precommitment to a rule limiting discretionary monetary policy. Those who espouse this approach differ with respect to the form of precommitment.<sup>8</sup> Some advocate a constant monetary growth rule or a constant money supply. A gold standard or general commodity standard is advocated by others. Finally, some economists envision a deregulated financial system in which money will disappear as a special financial instrument. Pending the day of its arrival, we may be well advised to seek improvements in the system as we now know it. The improvements would end monetary instability and assure a monetary growth rate that can give long-term price stability.

### Deposit Insurance in a Deregulated Financial System

It is generally believed that deregulation will lead to an increase in portfolio risk that financial institutions will be willing to incur given the existing federal deposit insurance system. Since the Federal Deposit Insurance Corporation (FDIC) charges a fixed premium for deposit insurance with no variation for the degree of risk of bank portfolios, it promotes moral hazard. A recent proposal by the FDIC to price deposit insurance would rate banks according to capital adequacy, credit, and interest rate risk, and assign them to three risk categories: normal, high, and very high.<sup>9</sup>

<sup>8</sup>R. J. Barro, "United States Inflation and the Choice of Monetary Standard," and R. E. Hall, "Explorations in the Gold Standard and Related Policies for Stabilizing the Dollar," in R. E. Hall, ed., *Inflation: Causes and Effects*, Chicago: University of Chicago Press, 1982, pp. 99-122.

<sup>9</sup>Deposit Insurance in a Changing Environment: A Study of the Current System of Deposit Insurance Pursuant to Section 712 of the Garn-St. Germain Depository Institutions Act of 1982, Submitted to the United States Congress by the Federal Deposit Insurance Corporation, Washington, D.C., April 1983.

Some economists propose instead a private deposit insurance system that would be introduced gradually to compete with the FDIC.<sup>10</sup> During the transition, the FDIC would remain the principal provider, but entry of private firms would be encouraged by eliminating de facto coverage of deposits above statutory limits, reducing coverage and introducing coinsurance, and eliminating the requirement that banks purchase deposit insurance from the FDIC. It is argued that private insurance companies would have an incentive to assume regulatory functions in evaluating risk of financial institutions. These issues are likely to be given increasing attention as deregulation proceeds. In the 1930s, federal deposit insurance may have been the correct response to the breakdown of confidence in the banking system. Ongoing and prospective changes in the financial environment justify a reexamination of the issue.

### International Debt Problems

A widely held belief in the United States and the world financial community is that the default of major international debtors could lead to bank failures that would precipitate a financial crisis. The remedy proposed by those propagating this view is that international debtors must be rescued from the threat of default to avert the projected dire consequences for banks and for the stability of the financial system. The rescue is justified on the ground that the debt problem has been caused mainly by world recession, oil shocks, and high interest rates, rather than misguided debtor-country policies. World recovery, continued involuntary lending by creditor banks to the debtor countries, and increased lending by the International Monetary Fund (IMF), the World Bank, and export credit agencies until 1985 or 1986 constitute the standard prescription for managing the debt problem.<sup>11</sup> A more radical prescription takes the view that regardless of the extent of world recovery, the debt problems of the borrowers are unmanageable unless their real burden is reduced. Plans to reduce the burden include a buyout of the banks' loans at a 10 percent discount by a newly established agency that would pay the banks in long-term bonds, itself becoming the creditor of the borrowing countries and offering a stretch-out of the debt and reduction in interest rates; sale of foreign loans by banks after markdown to market to the IMF, World Bank, or a new agency; or resale to the public, while debtors would convert their loans to consols

<sup>10</sup>E. D. Short and G. P. O'Driscoll, Jr., "Deregulation and Deposit Insurance," *Federal Reserve Bank of Dallas Economic Review*, September 1983, pp. 11-23.

<sup>11</sup>W. R. Cline, *International Debt and the Stability of the World Economy*, Washington, D.C.: Institute for International Economics, September 1983.

at market interest rates.<sup>12</sup>

The standard prescription assumes that the debts will all be paid off 100 cents on the dollar. The decline in prices of bank equity indicates that the market does not evaluate the foreign loans at face value. The radical prescription is realistic in its valuation of the value of the loans but would impose on taxpayers the burden of the losses that must be incurred. Writedowns and default are ways of easing the burden of foreign borrowers and do not necessarily imply that credit markets will be closed to them for the foreseeable future. In some countries, replacement of the existing government may be enough to convince creditors that more responsible policies will henceforth be adopted and therefore warrant further lending, despite the earlier loan history.

Writedown of loans to market and even default on some loans by some debtors would undoubtedly mean losses for bank stockholders and would cost the jobs of some management personnel—the parties that should bear the losses. Even if bank failures should result, so long as depositors know their accounts are secure, a financial crisis is not inevitable. The relative importance of capital versus monetary losses associated with bank failures may be judged by experience in 1929–33. Then, bank failures imposed direct losses totaling about \$2.5 billion on owners, depositors, and other creditors. The indirect effect of bank failures, however, was far more important. It amounted to a decline of \$18 billion in deposits because of the shift of public preference from deposits to currency.

## Conclusion

The United States has undoubtedly changed in many ways during the past two decades. The experience of an unprecedented peacetime inflation sensitized the academic and lay community to the role of accelerated monetary growth in producing that result. The experience also drove the Federal Reserve System to announce a change in its long-standing procedures to control monetary growth. Instability in economic growth, employment, and interest rates, despite or because of that announcement, has focused attention on the conduct of monetary policy. In an inflationary environment, regulation that was introduced in a period of relative price stability stimulated financial innovation and technological changes that led to de jure deregulation.

The issues raised by the changes are controversial. The specific components of a measure of money have changed not only recently but also over the ages. That does not invalidate the findings that Milton Friedman and I reported. Selecting a monetary measure that the Federal Reserve may target is not the key issue in mon-

etary policy. Whichever monetary measure the Federal Reserve will adopt—bank reserves, the monetary base, narrow money—it can determine its growth rate. Using procedures to minimize short-term variability of that measure and steadily reducing its annual rate of growth from year to year until it reaches a level consistent with zero inflation are the most important contributions the Federal Reserve can make to achieving real growth without the arbitrary effects of destabilizing and inflationary monetary surprises. There is no evidence that financial innovations have weakened the lagged effects of monetary actions on both economic activity and prices, or have significantly changed the length of the lags. Institutional adaptations of federal deposit insurance may be required because of changes in the financial environment. Some sovereign countries may default on their debts and some banks may suffer losses that will result in the transfer of their liabilities to an assuming bank or to paying off depositors of a smaller failing bank. In neither case is a financial crisis an unavoidable consequence.

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# Economic Outlook Survey

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## Fourth Quarter 1983

Victor Zarnowitz

According to the November survey taken by NBER and the American Statistical Association, there is a substantial consensus among 37 professional forecasters that the U.S. economy will continue to expand throughout 1984 at better than 4 percent annual rates in real terms. Unlike in the comparable stages of recent expansions, inflation will not flare up again. Consumer expenditures will grow at lesser rates than in 1983 and a slowdown is projected for residential construction,

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<sup>12</sup>L. Weinert, "Banks and Bankruptcy," *Foreign Policy* 50, Spring 1982, pp. 138–149; J. Guttentag and R. Herring, "Overexposure of International Banks to Country Risk: Diagnosis and Remedies," testimony before the U.S. Congress, House Committee on Banking, Finance, and Urban Affairs, Subcommittee on International Trade, Investments, and Monetary Policy, 98 Cong., 1st Sess., April 26, 1983.

## Projections of GNP and Other Economic Indicators, 1983-84

	Annual						Percent Change	
	1982	1983	1984	1982	1983			
	Actual	Forecast	Forecast	to	to	1983	1984	
1. Gross National Product (\$ billions)	3073.0	3313.0	3648.9	7.8	10.1			
2. GNP Implicit Price Deflator (1972 = 100)	206.9	215.7	226.0	4.3	4.8			
3. GNP in Constant Dollars (billions of 1972 dollars)	1485.4	1536.0	1616.0	3.4	5.2			
4. Unemployment Rate (percent)	9.7	9.7	8.3	0.0 <sup>1</sup>	-1.4 <sup>1</sup>			
5. Corporate Profits After Taxes (\$ billions)	127.2	132.0	164.0	3.8	24.2			
6. Nonresidential Fixed Investment (billions of 1972 dollars)	166.1	166.0	180.1	-0.1	8.5			
7. New Private Housing Units Started (annual rate, millions)	1.1	1.7	1.7	60.4	1.2			
8. Change in Business Inventories (billions of 1972 dollars)	-9.4	-1.6	11.7	7.8 <sup>2</sup>	13.3 <sup>2</sup>			
9. Treasury Bill Rate (3-month, percent)	10.7	8.6	8.8	-2.1 <sup>1</sup>	0.2 <sup>1</sup>			
10. Consumer Price Index (annual rate)	6.1	3.3	5.0	-2.8 <sup>1</sup>	1.7 <sup>1</sup>			

	Quarterly							Percent Change	
	1983	1983	1984						
	Q3	Q4	Q1	Q2	Q3	Q4	Q3 83 to	Q4 83 to	
	Actual		Forecast				Q3 84	Q4 84	
1. Gross National Product (\$ billions)	3363.3	3447.0	3525.0	3603.0	3687.0	3770.0	9.6	9.4	
2. GNP Implicit Price Deflator (1972 = 100)	216.4	218.7	221.7	224.7	227.7	230.6	5.2	5.4	
3. GNP in Constant Dollars (billions of 1972 dollars)	1554.4	1575.0	1592.0	1609.0	1627.0	1642.5	4.7	4.3	
4. Unemployment Rate (percent)	9.4	8.9	8.6	8.5	8.3	8.1	-1.1 <sup>1</sup>	-0.8 <sup>1</sup>	
5. Corporate Profits After Taxes (\$ billions)	141.9	149.7	155.0	161.0	167.0	172.2	17.7	15.0	
6. Nonresidential Fixed Investment (billions of 1972 dollars)	168.7	173.0	175.4	179.0	182.0	184.9	7.9	6.9	
7. New Private Housing Units Started (annual rate, millions)	1.8	1.6	1.7	1.7	1.8	1.7	-2.2	4.5	
8. Change in Business Inventories (billions of 1972 dollars)	4.8	9.7	9.6	12.0	12.0	13.1	7.2 <sup>2</sup>	3.4 <sup>2</sup>	
9. Treasury Bill Rate (3-month, percent)	9.2	8.8	8.6	8.6	8.7	8.8	-0.5 <sup>1</sup>	0.0 <sup>1</sup>	
10. Consumer Price Index (annual rate)	4.9	5.0	4.9	4.9	5.1	5.4	0.2 <sup>1</sup>	0.4 <sup>1</sup>	

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

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

<sup>2</sup>Change in billions of dollars.

but business investment in fixed capital and inventories will rise faster. The rate of unemployment will decline steadily. Corporate profits will register handsome gains. On the average, only small quarter-to-quarter movements in interest rates are projected, around nearly horizontal levels. Thus the prospects for 1984 are definitely good. One important exception is net exports for which no improvement is anticipated.

### A Sustained Expansion Held Most Likely

Real GNP will increase 5.2 percent in 1983-84 and 4.3 percent between 1983:4 and 1984:4, according to the median point forecasts from the survey. On the whole, the forecasters expect that the rates of growth

will be lower in the second year of expansion than they were in the first year, as is usually the case. For the quarters 1984:1-1984:4, the range of the average predictions of the annual rates of increase in the nation's output of goods and services is 4.3 percent-4.7 percent.

In response to the question of what probabilities they attach to the alternative outcomes for the real GNP change in 1983-84, the survey participants report distributions whose means are concentrated in three percentage ranges: 6.0 or more, 13 percent; 4.0 to 5.9, 63 percent; and 2.0 to 3.9, 17 percent.

The chances of a decline in output during any quarter in the year ahead are assessed as 20 in 100 or less by all but a very few of the respondents. This is specific evidence that another recession is considered quite unlikely to occur in 1984.

## Smaller Reductions in Unemployment

The overall jobless rate is seen by most forecasters as declining slowly in 1984. The median predictions set it at 8.6 percent, 8.1 percent, and 8.3 percent for 1984:1, 1984:4, and 1984 as a whole, respectively (down from an estimated average 9.7 percent in 1983). The lower quartile figures are about 0.2 of one percentage point lower and may prove to be more accurate in the light of the most recent developments and data. But there are also some pessimists who foresee small transitory increases in the national unemployment rate.

## Inflation Gauges Slightly Up, Still Favorable

The average projections for the consumer price index (CPI) are that it will rise 5 percent or slightly less in this and the next two quarters, 5.1 percent in 1984:3 and 5.4 percent in 1984:4. The estimate for 1982-83 is 3.3 percent; the forecast for 1983-84 is 5 percent. Most individual forecasters for this variable are closely bunched: the interquartile range for 1984:4, for example, is 4.5 percent-5.7 percent.

Inflation will be somewhat higher in terms of the GNP implicit price deflator (IPD), which is less affected by the favorable import prices. The median forecasts, at annual rates, are 4.8 percent for 1983-84, 5.4 percent for 1983:4-1984:4, and varying between 5.2 percent and 5.6 percent for the four quarters 1984:1-1984:4.

The distributions of the mean probabilities attached to the possible changes in the IPD, shown below, indicate a small shift toward higher anticipated inflation rates.

<i>Percentage Change in IPD</i>	<i>1982-83</i>	<i>1983-84</i>
8.0 or more	1.2	2.6
6.0 to 7.9	3.6	16.2
4.0 to 5.9	79.0	64.8
Less than 4.0	16.2	16.4

## Hesitancy on Interest Rates

The three-month Treasury bill rate will average 8.8 percent in 1983:4 and 8.6 percent in both 1984:1 and 1984:2 before moving up to 8.7 percent and 8.8 percent in 1984:3 and 1984:4. The corresponding median forecasts for 1983 and 1984 are 8.6 percent and 8.8 percent, respectively. The interquartile range for 1984:4 is 8.1 percent-9.5 percent (the total range is as wide as 6 to 11 percent).

New high-grade corporate bond yields are to decline from 12.4 percent in 1983:4 to 11.9 percent in 1984:4. The averages for 1983 and 1984 are virtually identical: 12.1 percent and 12.0 percent. The central half of the individual forecasts for 1984:4 lies between 11.4 percent and 12.9 percent; the range is 10.5 percent to 14.0 percent.

Combined with the corresponding median predictions of CPI inflation, the Treasury bill rate forecasts imply that the real short-term interest rates will decline from 3.8 percent in 1983:4 to 3.4 percent in 1984:4; and the high-grade corporate bond yield forecasts imply that the real long-term interest rates will also decline in the same period, from 7.4 percent to 6.5 percent. However, when the IPD inflation forecasts are used, the implicit real rate forecasts decline sharply in 1984:1 only (from 4.5 percent to 3.0 percent for the bill rate and from 8.1 percent to 6.4 percent for the bond yields) and then rise slightly through 1984:4 (to 3.6 percent and 6.7 percent, respectively).

## The Rise in Profits: How Strong and How Durable?

Corporate profits after taxes in current dollars will increase 3.8 percent in 1982-83 and as much as 24.2 percent in 1983-84. Along with the corresponding figures for such variables as GNP, real growth, and inflation, these median group forecasts indicate sizable increases in profit shares and margins as well as in total real profits. For example, the net profits of corporations would represent about 4 percent of GNP in 1983, 4.5 percent in 1984.

The rise in profits, however, is seen as tapering off. In the five quarters, 1983:4-1984:4, the successive percentage gains in profits, at annual rates, are expected to average 24, 15, 4, 4, and 13.

## The Growth of Industrial Output and Business Investment

Manufacturing, mining, and utilities should contribute much more to the expansion in 1984 than the cyclically less sensitive sectors: industrial production is to gain 9.1 percent in 1983-84, against an overall growth rate of 5.2 percent. Here too, however, some slowing is expected: for example, the industrial output is predicted on the average to rise 5.3 percent between 1983:4 and 1984:4.

Nonresidential fixed investment, which stagnated or declined slightly in 1982-83, is gathering strength and will increase 8.5 percent in 1983-84 and 5.9 percent in 1983:4-1984:4, according to the median survey forecast. This is after allowing for inflation and it suggests a rise in the share of real GNP represented by business investment in plant and equipment.

A moderate expansion of the volume of business inventories next year is anticipated by most of the forecasters, consistent with their optimism about the outlook for sales, production, and investment.

## Weaker Increases in Consumption and Housing

Real expenditures on consumption will rise 4.2 percent in 1983-84 and 3.5 percent during the next year

(1983:4-1984:4). If this average forecast comes true, the share of consumption in total output will decline, reversing the recent trend.

Housing starts, estimated at an annual rate of 1.65 million units for 1983:4 (down from 1.79 million in 1983:3) will not increase much next year. The median predictions are 1.70 for 1983 and 1.72 for both 1984:4 and 1984 as a whole. Residential fixed investment in billions of 1972 dollars at annual rates is to increase from 53 to 58.6 in 1983-84 and from 57 to 60 in 1983:4-1984:4. Its gain in 1982-83 will be close to 40 percent; its gain in 1983-84 about 10.5 percent.

## Exports Depressed, Views on the Dollar Mixed

Net exports of goods and services will hover between 6 and 7 billions of 1972 dollars at annual rates in the four quarters of 1984. However, these average forecasts conceal a very high dispersion of individual predictions: for example, the mean for 1984:4 is 7.8 and the standard deviation is 6.2. The distributions are skewed toward higher figures, with means significantly higher than the medians. All this reflects the uncertainty about future exchange rates: 13 respondents report that they have assumed that the dollar will weaken, 9 that it will remain strong and stable.

## Government Spending and Policies

Federal government purchases of goods and services will rise 2.1 percent in 1982-83, 5.0 percent in 1983-84, and 6.2 percent between 1983:4 and 1984:4, in real terms. The corresponding median forecasts for state and local government purchases are 0.5 percent, 2.3 percent, and 2.2 percent.

The reported assumptions on defense outlays are as follows: 11 respondents report assuming a buildup of 1-5 percent, 18 one of 6-8 percent, and 4 one of 9-13 percent.

Thirty-one forecasters assume no change in tax policy, six that additional taxes will be imposed in 1984.

The assumptions about monetary policy are: M1 growth of 4-6 percent, 11 respondents; of 7-11 percent, 10 respondents; M2 growth of 7-11 percent, 17 respondents.

There is also a considerable divergence of views on energy. A rise in demand is expected by many forecasters but most assume that energy prices will be stable, some that they will firm up but moderately.

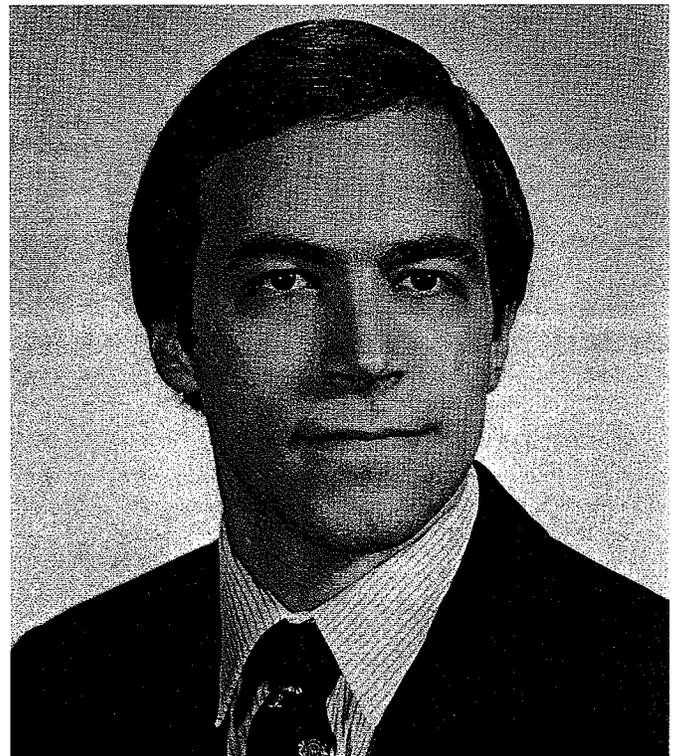
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*This report summarizes a quarterly survey of predictions by about thirty business, academic, and government economists who are professionally engaged in forecasting and are members of the Business and Economics Statistics Section of the American Statistical 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.*

## Alan J. Auerbach

Alan J. Auerbach, associate professor of economics at the University of Pennsylvania, is a research associate in NBER's Programs in Taxation, Economic Fluctuations, and Productivity. He received a B.A. in economics and mathematics (summa cum laude) from Yale University and a Ph.D. from Harvard University.

From 1978 to 1983, Auerbach was on the economics faculty of Harvard University. During the 1983 academic year, he was a visiting associate professor at Yale University, and in July he joined the economics department at the University of Pennsylvania.



Auerbach is on the board of directors of The Taxpayers' Committee and is associate editor of the *Journal of Public Economics*. He has written numerous journal articles, mostly in the field of taxation, and two books: *The Taxation of Capital Income*, and (as editor, with Martin Feldstein) *Handbook of Public Economics*, forthcoming.

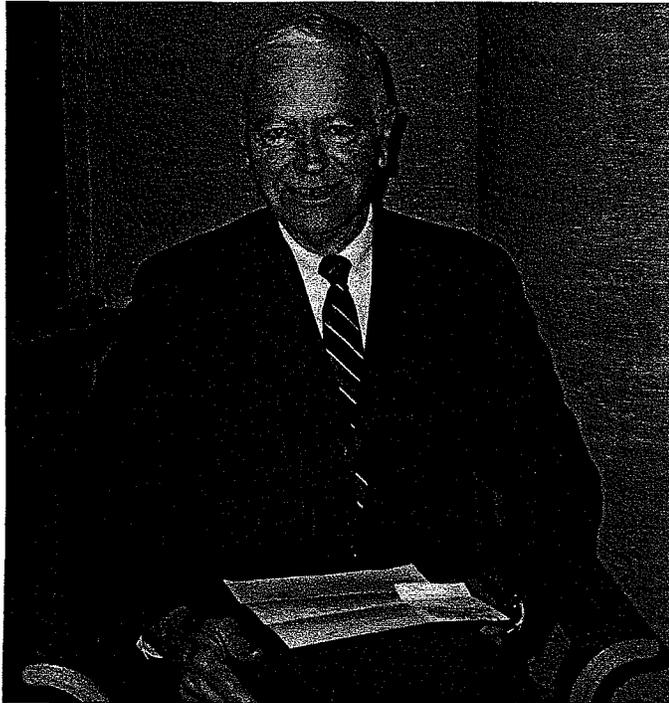
Auerbach and his wife Gay have a son, Ethan, who expects a brother or sister in July. With their dog and two cats, the Auerbachs reside in Bryn Mawr, where Ethan is studying finger painting and tricycle stunting.

# Conference Calendar

## N. James Simler

James Simler, chairman of the economics department at the University of Minnesota, has been a member of NBER's Board of Directors since 1980 and was elected to its Executive Committee in September. Simler received his B.S. and M.A. degrees from Georgetown University and a Ph.D. from the University of Minnesota.

With the exception of a year as senior economist with the Council of Economic Advisers and another as a Ford Foundation Faculty Research Fellow, Simler has been on the economics faculty at the University of Minnesota since 1959. He was named department chairman in 1967.



Simler was a member of the advisory board of editors of the *Journal of Human Resources* from 1971 to 1982 and of the American Economic Association's Census Advisory Committee from 1976 to 1983. His recent research interests include economics of the performing arts, union initiation fees, calculation of customer damages in anti-trust suits, and inflation and labor participation.

Simler is married and has two children. His wife, Lucy, is an independent scholar specializing in early American social and economic history. Simler's hobbies include playing tennis, listening to jazz, and reading espionage novels.

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 Spring 1984 issue of the *Reporter* is March 15. If you have any questions about procedures for submitting materials for the calendar, please call Kirsten Foss at (617) 868-3900.

**February 23-24, 1984**

General Equilibrium Workshop, NBER

**March 8-9, 1984**

Program Meeting: Taxation, NBER

**March 9, 1984**

Trade Policy Issues Meeting, NBER

**March 22-24, 1984**

Income and Wealth: Long-Term Factors in American Economic Growth, NBER

**March 22-25, 1984**

Conference on Business Cycles, NBER

**April 5-6, 1984**

Panel on Economic Activity, Brookings Institution

**April 12-14, 1984**

Public Pensions, NBER

**April 13-14, 1984**

Conference on Public Policy, Carnegie-Rochester

**April 20, 1984**

Program Meeting: Labor Studies, NBER

**April 26-27, 1984**

Program Meeting: International Studies, NBER

**May 3-4, 1984**

Program Meeting: Financial Markets and Monetary Economics, NBER

**May 21-22, 1984**

Spring Symposium, National Tax Association\*

**June 11-15, 1984**

Interlaken Seminar on Analysis and Ideology, University of Rochester

**June 14-16, 1984**

State and Local Public Finance, NBER

**June 18-22, 1984**

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

**June 24-28, 1984**

Annual Meeting, Western Economic Association

**July 12-13, 1984**

Conference on Macroeconomics, NBER

**August 5-8, 1984**

Annual Meeting, American Agricultural Economics Association\*

**August 13-16, 1984**

Annual Meeting, American Statistical Association\*

**September 13-14, 1984**

Panel on Economic Activity, Brookings Institution

**September 19-22, 1984**

Debt/Equity Conference, NBER

**September 23-25, 1984**

Annual Meeting, National Association of Business Economists\*

**October 1984**

Annual Meeting, International Association of Energy Economists\*

**November 14-16, 1984**

Annual Meeting, Southern Economic Association\*

**November 15-16, 1984**

Public Sector Payrolls, NBER

**November 25-28, 1984**

Annual Conference, National Tax Association\*

**December 28-30, 1984**

Annual Conference, American Economic Association\*

**February 8, 1985**

Monetary Policy in a Changing Environment, American Enterprise  
Institute

**August 4-7, 1985**

Annual Meeting, American Agricultural Economics Association\*

**August 12-15, 1985**

Annual Meeting, American Statistical Association\*

**September 29-October 2, 1985**

Annual Meeting, National Association of Business Economists\*

**December 28-30, 1985**

Annual Conference, American Economic Association\*

**July 27-31, 1986**

Annual Meeting, American Agricultural Economics Association\*

**September 13-17, 1986**

Annual Meeting, National Association of Business Economists\*

**December 28-30, 1986**

Annual Conference, American Economic Association\*

**August 2-5, 1987**

Annual Meeting, American Agricultural Economics Association\*

**September 27-October 1, 1987**

Annual Meeting, National Association of Business Economists\*

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

# Bureau News

## New Board Members Named

Four new members were elected to NBER's Board of Directors at its fall meeting: Marcus Alexis, Ann F. Friedlaender, Robert S. Hamada, and John M. Vernon.

Alexis, a native of New York City, is a professor of economics and chairman of the department at Northwestern University. He holds an A.B. in economics from Brooklyn College, an M.A. from Michigan State University, and a Ph.D. from the University of Minnesota. Before joining the Northwestern faculty in 1970, Alexis taught at Macalester College, De Paul University, and the University of Rochester. He also served as Commissioner, Vice Chairman, and Acting Chairman of the Interstate Commerce Commission. Since 1974 he has been chairman of the American Economic Association (AEA) Committee on the Status of Minority Group Members in the Economics Profession.

Friedlaender, head of MIT's Department of Economics and a professor of economics and civil engineering, received the B.A. in economics from Radcliffe College and the Ph.D. from MIT. Prior to joining the MIT faculty in 1974, Friedlaender taught at Boston College. She has served on the Executive Committee of the AEA since 1982 and was chair of AEA's Committee on the Status of Women in the Economics Profession from 1978-80.

Born in San Francisco, Hamada is professor of finance and director of the Center for Research in Security Prices at the Graduate School of Business, University of Chicago. He received a B.E. in chemical engineering from Yale University, an S.M. from MIT's Sloan School of Management, and a Ph.D. in finance from the Sloan School. Hamada has been on the University of Chicago faculty since 1966. He was also elected to the board of directors of the American Finance Association, which he represents on NBER's Board, in 1982.

Vernon is professor of economics at Duke University, where he has taught since 1966. He holds a Bachelor of Mechanical Engineering degree from Georgia Tech, an MBA from the University of Mississippi, and a Ph.D. in economics from MIT. Vernon, whose major research interests include industrial organization and applied microeconomics, is on the Board of Editors of *Managerial and Decision Economics*.

## Tax Group Convenes in Cambridge

Members and guests of NBER's Program in Taxation met on October 27-28 in Cambridge to discuss the following agenda:

Stewart C. Myers, MIT and NBER, joint work with Saman Majd, MIT, "Valuing the Government's Claim on a Risky Asset"

Discussant: Jerry R. Green, Harvard University and NBER

Joel Slemrod, University of Minnesota and NBER, joint work with Nikki Sorum, "The Compliance Costs of the U.S. Individual Income Tax System"

Discussant: Charles T. Clotfelter, Duke University and NBER

Alan J. Auerbach, University of Pennsylvania and NBER, "Corporate Taxation in the United States"

Discussant: Lawrence H. Summers, Harvard University and NBER

Harvey S. Rosen, Princeton University and NBER, joint work with Kenneth T. Rosen, University of California, Berkeley, and Douglas Holtz-Eakin, Princeton University, "Housing Tenure, Uncertainty, and Taxation" (NBER Working Paper No. 1168)

Discussant: Patric H. Hendershott, Ohio State University and NBER

John J. Seater, North Carolina State University, "Macroeconomic Determinants of the Graduated Income Tax"

Discussant: Don Fullerton, Princeton University and NBER

Roger H. Gordon, Bell Laboratories and NBER, joint work with John Wilson, Columbia University, "An Examination of Multijurisdictional Corporate Income Taxes under Formula Apportionment"

Laurence J. Kotlikoff, Yale University and NBER, and John B. Shoven, Stanford University and NBER, joint work with Avia Spivak, University of Pennsylvania, "Annuity Markets, Savings, and the Capital Stock" (NBER Working Paper No. 1250)

Discussant: Fischer Black, MIT and NBER

The paper by Myers and Majd explores the effects of tax asymmetries on the value of risky capital investments made by corporations. The authors use concepts of option pricing and Monte Carlo simulation to value a firm's tax liability as a contingent claim. Their preliminary numerical results indicate that tax asymmetries can reduce the aftertax value of a project by as much as one-fifth of required investment.

Slemrod and Sorum present the results of a survey of the behavior of Minnesota taxpayers concerning their tax filing. A random sample of 2000 residents was questioned about how much time and money they spent on tax matters, the details of their tax returns, and some

demographic information. The survey results indicated that in 1982 the compliance cost of the income tax system amounted to as much as 5 percent of the revenues collected. Further analysis of the data will be conducted in order to determine the probable resource savings from various measures for simplification of taxes.

In his paper, Auerbach surveys postwar trends in the impact of the corporate tax. In spite of its decline as a source of revenue, the corporate tax continues to influence both real and financial business decisions. This paper concentrates on a number of empirical questions, including: How distortionary is the corporate tax with respect to the allocation of capital? How does the asymmetric treatment of gains and losses affect the incentive to invest? How much of a decline in the market value of corporate capital may be attributed to the time pattern of depreciation allowances? And, how should one adjust for the varying riskiness of different components of each firm's aftertax returns? Ultimately, the results suggest that the distortions of the corporate tax have not lessened in magnitude as revenues declined, but that outright repeal of the tax would represent an inefficient approach to tax reform.

According to the paper by Rosen et al., the standard approach to the analysis of the homeownership choice assumes that households know the user cost of housing with certainty. However, ex post measures of the user cost exhibit substantial variability over time, and it is highly unlikely that individuals believe themselves able to forecast these fluctuations with certainty. This paper constructs and estimates a model of the tenure choice (in housing) that explicitly allows for the effects of uncertainty.

In his paper, Seater extends Barro's theory of tax and debt determination: taking expenditure as a given factor, the government chooses a path of tax collections (and thus deficits) to minimize the costs of collecting the taxes. By eliminating a restriction in Barro's original cost function, Seater shows that optimal tax rates are procyclical, in contrast to Barro's prediction of acyclicity. This result is important because observed tax rates are in fact procyclical. Next, Seater extends the basic theory by considering the public-choice aspects of the problem and shows that these result in a graduated system whose degree of progressivity is inversely related to the permanent share of GNP taken by government. Finally, he shows that tax rates are invariant to transitory government expenditure, so that Barro's most important result is preserved. Seater finds support for his theory in time-series analysis of the behavior of the federal income tax over the period 1913-78.

Gordon and Wilson's paper examines how corporate taxation of multijurisdictional firms that use formula apportionment affects the incentives faced by individual firms and individual states. They find that formula apportionment creates factor price distortions that vary in general among firms within a state, and in such a way as often to put multistate firms at a competitive advantage. Politically, formula apportionment appears to be very unstable—states face an incentive to shift to

some other form of taxation. These problems do not exist when a corporate tax uses separate accounting.

The work by Kotlikoff, Shoven, and Spivak examines how the availability of annuities affects savings and lifetime inequality of individuals' welfare in economies in which neither private nor public pensions exist initially. This paper compares economies having perfect insurance with economies in which completely selfish parents and children pool longevity risk to their mutual advantage. The analysis of the latter economies takes into account the infinite sequence of risk-sharing bargains of successive parents with their children. Such bargains affect current risk sharing between parents and child because they determine the future welfare of children who will become parents. Calculations indicate that perfecting annuity insurance can reduce national savings significantly. Indeed, the insurance aspects of government pensions are potentially as important as underfunding government pensions in reducing national savings.

In addition to the authors and discussants, the following NBER program members attended the meeting: Douglas Bernheim, Stanford University; David F. Bradford (Program Director), Princeton University; Daniel Feenberg and David G. Hartman; Daniel J. Frisch, U.S. Department of the Treasury; and James M. Poterba, MIT. Also participating were Emil Sunley of Deloitte, Haskins and Sells and Bernard Wolfman, Harvard University Law School.

## Program Meeting on Financial Markets Held

On November 3 and 4, members and guests of NBER's Program in Financial Markets and Monetary Economics met in Cambridge to discuss the following papers:

Patric H. Hendershott, Ohio State University and NBER, "Expectations, Surprises, and Treasury Bill Rates"

Discussant: John H. Makin, University of Washington and NBER

Takatoshi Ito, University of Minnesota and NBER, "Interdependence of Exchange Rates and Interest Rates"

Discussant: Jacques Melitz, INSEE (Paris)

Lawrence H. Summers, Harvard University and NBER, and N. Gregory Mankiw, MIT, "Are Tax Cuts Really Expansionary?"

Discussant: Robert L. McDonald, Boston University and NBER

James M. Poterba and Julio J. Rotemberg, MIT and NBER, "Money in the Utility Function: An Empirical Implementation"

Discussant: Carl E. Walsh, Princeton University and NBER

Stanley Fischer, MIT and NBER, "Contracts, Credibility, and Disinflation"

Discussant: James L. Medoff, Harvard University and NBER

Hendershott's paper estimates the relationship between the six-month Treasury bill rate and the determinants of that rate during the 1960s and 1970s. His purpose is to test various hypotheses about the determination of interest rates and to decide whether relationships described by those hypotheses changed markedly in the early 1980s, when real (before-tax) six-month bill rates were 4 to 5 percentage points higher than in the 1960s and 1970s. He derives a relationship between observed changes in the T-bill rate and expected changes in the rate, unexpected changes in anticipated six-month inflation, and unexpected changes in industrial production (as derived from Livingston survey data). Forecasts in his study, from an equation estimated over the 1960-79 period, "explain" 70 percent of the 4 to 5 points. Moreover, the estimated equation explains over 90 percent of both the 6-percentage-point rise in the nominal bill rate in 1979 and 1980 and the 7½-percentage-point decline during 1981 and 1982. Thus there is little evidence in support of a marked change in the determination of the bill rate in the 1980s.

The paper by Ito employs a vector autoregression model to investigate the interdependence among U.S. and Japanese interest rates and exchange rates. First, the paper shows that exchange rates are strongly exogenous to both U.S. and Japanese interest rates. This calls into question a popular belief that the high U.S. interest rate causes the strong dollar. Second, Ito calculates the dynamic response functions to a typical shock to a system. Third, he calculates dynamic responses (cumulative multipliers) of not only the three variables in the system but also of the forward exchange rate through covered interest parity.

Summers and Mankiw begin by noting that the standard analysis of a tax cut in an IS-LM model concludes unambiguously that tax cuts are expansionary. In their paper, the authors consider a slight modification of this standard analysis. If money demand depends more upon consumer expenditure than on other components of GNP, then a tax cut has an ambiguous effect upon output: although the IS curve shifts in an expansionary direction, the change in the composition of output shifts the LM curve in a contractionary direction. Their empirical analysis suggests that some of the data may support this alternative money-demand specification. Thus, it is possible that the necessary condition for tax cuts to be contractionary may exist in our economy.

Poterba and Rotemberg's paper implements a new strategy for modeling the demands for money and other assets. The authors assume that asset holdings, along with consumption, enter the utility function of a "representative consumer." They derive asset demand functions and then use them to estimate the parameters of the underlying utility function. These estimates are then

used to compute interest elasticities of the demand for money, Treasury bills, and other assets. This approach of assets-in-the-utility-function is appealing both because it imposes more structure on asset demands than earlier studies, and because it is a simple way to characterize the time-series data on asset holdings and returns.

Using a model of long-term labor contracts, Fischer's paper investigates the role of contracting arrangements and the credibility of policymakers in determining the speed of disinflation. In the presence of such contracts, disinflation cannot be instantaneous. Calculations made using the structure of labor contracts in the United States suggest, though, that a totally credible disinflationary policy could reduce the inflation rate more rapidly than has occurred in the recent past. Once expectations about future policy are determined on the basis of experience rather than announcements, the model predicts disinflation patterns with speed and shape like those seen in the recent disinflation—which was no faster than would have been predicted on the basis of past experience. Thus the data show no substantial "Volcker-credibility" effect.

In addition to those already named, the following NBER program members participated in the two-day meeting: Andrew B. Abel and Benjamin M. Friedman (Program Director), Harvard University; Zvi Bodie and Alex Kane, Boston University; Richard Clarida and Laurence J. Kotlikoff, Yale University; Roger H. Gordon, Bell Laboratories; Terry Marsh and Robert Pindyck, MIT; V. Vance Roley, University of Washington; Daniel R. Siegel, Northwestern University; Paul Wachtel, New York University; and Jess B. Yawitz, Washington University. Paul Jenkins, Bank of Canada, also attended the two-day program.

## Labor Economists Hold Program Meeting

On November 18 members of NBER's Program in Labor Studies met at the Bureau's Cambridge office to discuss the following papers.

Andrew Weiss, Columbia University and NBER, "Determinants of Quit Behavior"

William Dickens, University of California, Berkeley, and NBER, and Kevin Lang, "A Test of the Dual Labor Market Hypothesis"

Robert Gregory, Australian National University, "Teenage Labor Supply: Unemployment and Unemployment Benefits"

Weiss's work, with Roger Klein and Richard Spady of Bell Laboratories, asks to what extent the correlation between wages and education is caused by the sorting effects of education rather than by learning that occurs in school. Also, to what extent are the pay differences between men and women, and between blacks and

whites, found in previous econometric research, the result of unobserved productivity differences rather than of discrimination by employers? Finally, what can be said about the factors that affect a worker's probability of quitting?

The authors assemble a unique data base that enables them to address these and other questions that have been at the center of various debates in labor economics. Among their results are that individuals who stay in school longer than expected also remain on the job longer than expected. The unobserved factor(s) resulting in this positive correlation can explain, at least in part, the positive correlation between education and earnings.

Dickens and Lang estimate a statistical model that allows for the existence of two labor markets but does *not* require the researcher to make a priori assignments of workers to sectors. They easily reject the assumption of a single wage equation common to all workers. Moreover, it appears that wages in the high-wage (primary) sector reflect factors such as experience and schooling that are normally believed to affect wages; however, in the low-wage (secondary) sector there are no returns to schooling or experience.

The authors also find some support for the view that minority workers, and possibly others, find it difficult to obtain employment in the primary sector. This factor seems to account for a substantial portion of observed white/nonwhite wage differences.

Gregory's work with R. C. Duncan begins by noting that the very high levels of teenage unemployment experienced in Australia since 1974 have largely been thought to be caused by the differential impact of employment demand on the youth labor market. In this paper the authors show that during the recession, teenage employment was favored relative to the employment trends of the past and that the increases in teenage unemployment largely arose from the marked change in the labor force participation rate. The paper goes on to examine factors that seem to have been important in generating the changed supply response—changes in school participation rates, the increased importance of part-time work, increases in unemployment benefits, the permissible income levels for unemployment benefit recipients, changes in wage levels, and the important interactions among these various factors.

In addition to the authors named above, participants at the meeting included NBER program members: Katharine G. Abraham and Casey Ichniowski, MIT; Joseph G. Altonji, Columbia University; David E. Bloom, James L. Medoff, and David A. Wise, Harvard University; Charles C. Brown, University of Maryland; James N. Brown and David Card, Princeton University; Alan L. Gustman, Dartmouth College; David G. Hartman; Harry J. Holzer, Michigan State University; Edward P. Lazear, University of Chicago; Jonathan Leonard, University of California, Berkeley; Shelly Lundberg, University of Pennsylvania; Olivia S. Mitchell, Cornell University; and Thomas L. Steinmeier, Texas Tech University. Also joining the group were Wayne Gray of Harvard University and Richard Spady of Bell Laboratories.

# Palo Alto Office Hosts Meeting

An NBER program meeting on economic fluctuations was held at the Bureau's Palo Alto office on December 2. The day's agenda was:

Robert J. Barro, University of Chicago and NBER, "Real Determinants of Real Exchange Rates"

Discussants: Jose Vinals, Stanford University, and Richard Meese, University of California, Berkeley

George Akerlof and Janet Yellen, University of California, Berkeley, "The Macroeconomic Consequences of Near-Rational Rule-of-Thumb Behavior"

Discussants: Thomas E. MaCurdy, Stanford University and NBER, and Sean Beckett, University of California at Los Angeles (UCLA)

Martin S. Eichenbaum, Carnegie-Mellon University, and Lars Peter Hansen, University of Chicago and MIT, "Uncertainty, Aggregation, and the Dynamic Demand for Consumption Goods"

Discussants: Michael Gibbons, Stanford University, and Robert Engle, University of California, San Diego

Robert E. Lucas, University of Chicago and NBER, "Money in a Theory of Finance"

Discussants: Douglas Breeden, Stanford University, and Milton Friedman, Hoover Institution

Robert E. Hall, Stanford University and NBER, "The Wage Adjustment Process"

Discussants: Paul Evans, Stanford University, and David Lilien, University of Southern California

Barro's paper notes that arbitrage conditions in international trade imply purchasing power parity in real exchange rates. Yet measured real exchange rates have fluctuated significantly since the early 1970s. Barro provides an accounting of the sources of these fluctuations. Beginning with a decomposition of gross domestic product into tradable goods, nontradables, and oil, his paper measures the contribution of various real factors in real exchange rate determination. Barro finds that for industrialized countries, much of the fluctuation in real exchange rates over the 1952-82 period are explained by shifts in the terms of trade, changes in the relative price of oil, variables that affect the relative price of nontraded and traded goods, and by movements in tax and tariff rates.

Most of economic theory, Akerlof and Yellen's work notes, is based on the assumption that agents optimize in their decisionmaking because they have significant financial incentives to do so. Akerlof and Yellen challenge this basic assumption and examine the individual and social welfare losses that come when some agents are not fully "rational." Using separate examples of money demand and wage-setting behavior, the authors examine the effects of a change in the money supply on an economy consisting of two types of individuals:

those who fully optimize in decisionmaking and those who follow simple rules of thumb. While nonoptimizing individuals suffer a welfare loss relative to optimizers, this loss will generally be small for small changes in the money supply. Social losses stemming from near-rational behavior are larger than individual losses by an order of magnitude. This result follows from externalities caused by nonoptimizers. That is, the welfare of optimizing agents is lower in the near-rational equilibrium than in an equilibrium where all agents optimize. Akerlof and Yellen argue that the small incentives for individuals to fully optimize coupled with the large social consequences from their failure to do so may help in understanding the nature of business cycles.

Eichenbaum and Hansen's paper explores several unresolved issues in the analysis of consumption behavior as an outgrowth of the many recent empirical studies that attempt to test the econometric implications of the permanent income hypothesis. Eichenbaum and Hansen construct a model that relates the demand for the unobservable flow of services from consumption goods to the observable purchases of consumption goods. This model also allows the authors to translate the demands of different consumers into the more easily handled representative consumer framework. Other generalizations of the standard consumption model, such as costs to adjusting the level of consumption, are also considered. In accord with previous studies, the authors find that the U.S. data are inconsistent with many of the restrictions implied by economic theory.

Lucas's paper analyzes the connections between monetary theory and the theory of finance. These two areas of economics have quite different objectives: monetary theory seeks to assess the effects of changes in monetary and fiscal policy, while the theory of finance attempts to explain the determinants of the structure of investors' portfolios. Lucas finds that these differences in objectives lead to substantial differences in analytical techniques. In particular, results in finance are derived from the most general properties of the contingent claim general equilibrium model. However, answering the critical questions of monetary theory requires one to solve the contingent claim model for the values of the economic variables and not simply to explore general relationships among these variables. The great difficulty of solving these models leads monetary theorists to focus on tractable special cases. Finance theorists, on the other hand, tend to broaden the scope of application of their theorems. Lucas argues that these considerations are a permanent obstacle to any attempt to unify monetary theory and the theory of finance.

In his paper, Hall examines aggregate U.S. data on consumption, unemployment, and hourly compensation in an attempt to infer the form of the wage adjustment rule used by firms in the post-World War II era. Hall points out that the implicit contract theory of employment requires that firms precommit themselves to some particular rule for changing wages. Without such a precommitment, firms have a strong inducement to

renege on the terms of employment implicitly agreed to at the time a worker is hired. Hence, in order to continue to attract workers, firms will stick, at least for a while, to some fixed wage adjustment rule even when later events reveal flaws in the rule that was chosen. Hall concludes that U.S. firms chose rules that anticipated permanent changes in the *price level* but did not anticipate permanent changes in the *inflation rate*.

In addition to the authors and discussants, the following NBER economists attended the meeting: Moses Abramovitz (Research Associate Emeritus), Michael J. Boskin, Jeremy I. Bulow, and John B. Shoven, Stanford University; Michael R. Darby, UCLA; John H. Makin and Charles Nelson, University of Washington; Joel Slemrod, Hoover Institution; Lawrence H. Summers, Harvard University; Jim Wilcox, University of California at Berkeley; and Bronwyn H. Hall. Also participating in the sessions were: Kenneth Arrow, S. Bhattacharya, John Cuddington, Paul Evans, Peter Hammond, Milton Harris, Bert G. Hickman, Kazuo Inaba, Stephen R. King, Mordecai Kurz, Ron McKinnon, Hajime Miyazaki, and Debraj Ray, Stanford University; Joseph Bisignano and John Scadding, Federal Reserve Bank of San Francisco; Roger Craine and James Pierce, University of California at Berkeley; Levis Kochin, University of Washington; Thomas Mayer, Steven Sheffrin, and Joaquim Silvestre, University of California at Davis; and Joseph A. Pechman, Hoover Institution.

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420. "Intertemporal Price Speculation and the Optimal Current-Account Deficit," by Maurice Obstfeld, 1983 (NBER Working Paper No. 1100)
421. "Capital Gains Taxation in an Economy with an 'Austrian Sector,'" by Daniel J. Kovenock and Michael Rothschild, 1983 (NBER Working Paper No. 758)
422. "Intergenerational Externalities," by Edward P. Lazear, 1983 (NBER Working Paper No. 145)

423. "The Tax Treatment of Married Couples and the 1981 Tax Law," by Daniel Feenberg, 1983 (NBER Working Paper No. 872)
424. "National Savings, Economic Welfare, and the Structure of Taxation," by Alan J. Auerbach and Laurence J. Kotlikoff, 1983 (NBER Working Paper No. 729)
425. "Government Policy and the Allocation of Capital between Residential and Industrial Use," by Patric H. Hendershott, 1983 (NBER Working Paper No. 1036)

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## Current Working Papers

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#### Pitfalls in the Use of Time as an Explanatory Variable in Regression

**Charles R. Nelson and Heejoon Kang**  
Technical Working Paper No. 30  
November 1983  
JEL Nos. 210, 212

Regression of a trendless random walk on time produces R-squared values around 0.44 regardless of sample length. The residuals from the regression exhibit only about 14 percent as much variation as the original series even though the underlying process has no functional dependence on time. The autocorrelation structure of these "detrended" random walks is pseudo-cyclical and purely artifactual. Conventional tests for trend are strongly biased toward finding a trend when none is present, and this effect is only partially mitigated by Cochrane-Orcutt correction for autocorrelation. We extend the results to show that pairs of detrended random walks exhibit spurious correlation.

## Deep Structural Excavation? A Critique of Euler Equation Methods

Peter M. Garber and Robert G. King  
Technical Working Paper No. 31  
November 1983  
JEL Nos. 023, 210

Rational expectations theory instructs empirical researchers to uncover the values of "deep" structural parameters of preferences and technology rather than the parameters of decision rules that confound these structural parameters with those of forecasting equations. This paper reevaluates one method of identifying and estimating such deep parameters, recently advanced by Hansen and Singleton, that uses intertemporal efficiency expressions (Euler equations) and basic properties of expectations to produce orthogonality conditions that permit parameter estimation and hypothesis testing. These methods promise the applied researcher substantial freedom, as it is apparently not necessary to specify the details of dynamic general equilibrium to study the behavior of a particular market participant. In this paper, we demonstrate that this freedom is illusory. That is, if there are shifts in agents' objectives that are not directly observed by the econometrician, then Euler equation methods encounter serious identification and estimation difficulties. For these difficulties to be overcome, the econometrician must have prior knowledge concerning variables that are exogenous to the agent under study, as in conventional simultaneous equations theory.

## Working Papers Series

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*Journal of Economic Literature* (JEL) subject codes, when available, are listed after the date of the Working Paper. Abstracts of all Working Papers issued since October 1983 are presented below. For previous Working Papers, see past issues of the *NBER Reporter*. The Working Papers are intended to make results of NBER research available to other economists in preliminary form to encourage discussion and suggestions for revision before final publication. Working Papers are not reviewed by the Board of Directors of NBER.

The Fall 1983 *NBER Reporter* inadvertently omitted two of the authors of Working Paper No. 1159, **Case Mix, Costs, and Outcomes: Differences between Faculty and Community Services in a University Hospital**. The authors are: Alan M. Garber, M.D., Victor R. Fuchs, and James F. Silverman, M.D.

## Sticky Prices, Money, and Business Fluctuations

Robert G. King and Joseph G. Haubrich  
Working Paper No. 1216  
October 1983  
JEL Nos. 023, 311

Can nominal contracts make a difference for the neutrality of money if they arise endogenously in general equilibrium? This paper utilizes a version of Lucas's seminal equilibrium theory of the business cycle to address this question. However, we depart from Lucas in assuming that: (1) agents have complete information about the money stock; (2) fundamental shocks to the system are purely redistributive and private information; and (3) moral hazard precludes conventional insurance markets. With an exogenous restriction on contracts, money is fully neutral. But, when this restriction is lifted, efficient risk sharing between suppliers and demanders leads to a potential nonneutrality of money. In particular, if an increase in the rate of growth of money signals a rise in the dispersion of shocks to demanders' wealth, then prices adjust only partially to monetary shocks and there is a positive association between money and output.

## Corporate Pension Policy and the Value of PBGC Insurance

Alan J. Marcus  
Working Paper No. 1217  
October 1983  
JEL No. 521

This paper derives the value of PBGC pension insurance under two interesting scenarios. The first allows for voluntary plan termination, which appears to be legal under current statutes; in the second, termination is prohibited unless the firm is bankrupt. I examine optimal strategy for pension funding in each case. Finally, I empirically estimate PBGC liabilities. My calculations show that a small number of funds account for a large fraction of total prospective PBGC liabilities, that those total liabilities greatly exceed current PBGC reserves for plan terminations, and that PBGC liabilities could be reduced substantially by the prohibition of voluntary termination.

## **Liability for Harm versus Regulation of Safety**

**Steven Shavell**

Working Paper No. 1218  
October 1983

Using the instrumentalist, economic method of analysis, I consider liability in tort and the regulation of safety as means of controlling risks of accidents. I first identify four general determinants of the relative social desirability of liability and regulation: (1) differences in knowledge about risky activities as between a social authority and private parties; (2) the possibility that parties would not be able to pay fully for harm done; (3) the chance that they would not face suit for harm done; and (4) administrative costs. Based on analysis of these determinants, I suggest that the observed choices made between liability and regulation, when broadly viewed, are socially rational. Notably, activities that create the risk of the typical tort and that are little regulated characteristically display features leading us to say that they ought to be controlled mainly by liability. Activities that are much regulated—especially those involving significant hazards to health or to the environment—ought to be directly constrained in important ways, taking into account their usual features.

## **Uncertainty over Causation and the Determination of Civil Liability**

**Steven Shavell**

Working Paper No. 1219  
October 1983

This paper studies situations in which there is uncertainty over the cause of harm (for example, was the lung cancer caused by normal exposure to medical X-radiation, to smoking, or to exposure to carcinogens discharged by a chemical plant?). I identify the effects on incentives to reduce risk of various ways of treating such uncertainty under the liability system using a theoretical model of the occurrence of harm. The main points are these: Use of a *threshold probability* of causation (for example, 50 percent) as a criterion for determining liability may adversely affect behavior—parties might face a diminished burden of liability (if their probability of causation systematically fell below the threshold) and thus might do too little to reduce risk; or they might face an extra burden (if their probability were systematically above the threshold), and thus do too much. Second, the best *all-or-nothing* criterion for determining liability (a criterion under which a party is fully liable if at all liable) is different in form from a threshold probability criterion. Third, liability *in proportion to the probability of causation* is superior to all other criteria and results in socially ideal behavior.

I demonstrate and analyze these points in two types of cases: where the uncertainty involves a party versus natural or “background” factors; and where it involves which party among several was the author of harm. The importance of the points depends on the type of case and on the form of liability (strict liability or the negligence rule).

In a concluding section I discuss the interpretation of the analysis and important qualifications to it.

## **A Model of the Socially Optimal Use of Liability and Regulation**

**Steven Shavell**

Working Paper No. 1220  
October 1983

Using a theoretical model of the occurrence of accidents, I examine liability and safety regulation as means of controlling risks. According to the model, regulation does not result in appropriate reduction of risk—because of the regulator’s lack of knowledge about risk—nor does liability—because the incentives it creates are diluted by the chance that parties would not be sued for harm done or would not be able to pay fully for it. Thus, liability could either turn out to be superior to regulation or the reverse could be true. But, as I stress, joint use of the two means of controlling risk is generally socially advantageous, and I determine the characteristics of their optimal joint use.

## **The Conduct of Domestic Monetary Policy**

**Robert J. Gordon**

Working Paper No. 1221  
October 1983  
JEL No. 311

This paper develops the view that monetary policy operates within a set of basic constraints that limit the set of outcomes that it can achieve. These include constraints on aggregate supply behavior that determine how a given path of nominal income growth will be divided between inflation and output growth, and “velocity” constraints that influence the path of nominal income growth that will result from any given time path for the monetary base, monetary aggregates, or interest rates. The interaction of monetary policy decisions with shifts in constraints helps to explain the sources of deteriorating macroeconomic performance in the 1970s and early 1980s.

I illustrate the role of aggregate supply behavior with a one-equation approach to the econometric problem of predicting how changes in nominal GNP growth will

be divided between inflation and real GNP growth. I then use the results from the equation estimated through 1980 to examine the behavior of inflation during the 1981–82 recession and to predict the behavior of inflation and unemployment that would accompany alternative paths of nominal GNP growth after 1982.

I then examine the role of velocity in a new set of multivariate exogeneity tests using the vector autoregressive (VAR) approach for three separate sample periods (1953–61, 1962–70, and 1971–79). The major conclusions are that the monetary base has no significant explanatory role for spending changes. The Treasury bill rate appears to carry the main explanatory power, working directly on spending in the 1950s and indirectly through the money multiplier in the 1970s.

### **Economic and Statistical Analysis of Discrimination in Hiring**

**Ronald G. Ehrenberg and Robert S. Smith**

Working Paper No. 1222

October 1983

JEL Nos. 822, 917

Legal and administrative determinations of employers' compliance with "equal employment opportunity" (EEO) requirements often hinge on the issue of the *availability* of protected class members to employers. That is, courts and affirmative action review agencies compare the *hire rates* of protected class members (the ratio of the number of protected class members hired to the number who applied or who were potentially available) to the comparable ratio for other applicants, in assessing whether an employer's hiring policies meet the standards required of them by EEO regulations. The purpose of this paper is to review what economic theory suggests affects availability and to analyze the extent to which these factors are considered in administrative or judicial decisions concerning hiring policies. In our analyses, we point out areas where there seem to be inconsistencies or unresolved issues.

### **Modeling Individuals' Behavior: Evaluation of a Policymaker's Tool**

**Alan L. Gustman**

Working Paper No. 1223

October 1983

JEL No. 820

With a continuous decline in the cost of manipulating data and a continuous increase in the richness of

data banks, policymakers have increasing opportunities to build and apply so-called microsimulation models—models that attempt to simulate the behavior of the individuals in a large population under a specified program. The efforts of the Department of Labor to use a model in evaluating proposed changes in the unemployment system point up both the power and the weaknesses of such models. Any user who applies these models without attempting to understand which of their strengths and weaknesses are most important for analyzing the problem at hand is asking for trouble. Easy to use or not, these models are not user friendly.

### **Rational Expectations Models in Macroeconomics**

**John B. Taylor**

Working Paper No. 1224

November 1983

This paper is a review of rational expectations models used in macroeconomic research. The purpose is to examine in some detail the differences between the models, the advantages and disadvantages of alternative models, the empirical support for the models, and their policy implications. The main theme is that there is a wide diversity among rational expectations models in macroeconomics, despite their common expectational assumptions and methods of analysis. I review information-based and contract-based theories as alternative models of aggregate supply. I also provide a brief review of rational expectations models of the demand side, along with a discussion of some problems with the rational expectations assumption.

### **Optimal Stabilization Rules in a Stochastic Model of Investment with Gestation Lags**

**John B. Taylor**

Working Paper No. 1225

November 1983

This paper considers the problem of calculating optimal policy rules to stabilize fluctuations in investment in an economy where firms' investment behavior can be described by a dynamic optimization model. In the optimization model, the dynamics of investment are generated by heterogeneous gestation lags between the start and the completion of capital projects, rather than by adjustment costs in the installation of capital. I derive a procedure for calculating policy rules for an arbitrary autoregressive process generating fluctuations in firms' sales. Through stochastic simulation, I investigate the effects of using certain suboptimal policy rules in cases where there are constraints against using the optimal rules.

## **Unions, Pensions, and Union Pension Funds**

**Richard B. Freeman**

Working Paper No. 1226  
November 1983

This paper examines the role of trade unions as determinants of: pension coverage; expenditures by firms for pensions; the provisions of pension plans; and pension fund investments. It also examines the impact of union pensions on the age-earnings profile of union workers. It has four basic findings:

(1) Unions greatly influence pension coverage and alter the determinants of coverage in ways that go beyond the monopoly wage effects of unionism.

(2) Unions alter the provisions of pension plans in ways that benefit senior workers and that equalize pensions among workers.

(3) Estimates of the age-earnings profile of union workers are seriously flawed by failure to take account of the union impact on pensions, which generally enhance the earnings of the oldest groups.

(4) Union pension funds can and do shun the stocks of nonunion firms without lowering the value of the portfolio. Investments in actual projects that take lower returns are justifiable, up to a point, in terms of the *full* economic benefit accruing to workers.

## **Patents and R and D: Searching for a Lag Structure**

**Bronwyn H. Hall, Zvi Griliches, and Jerry A. Hausman**

Working Paper No. 1227  
November 1983

This paper extends earlier work on the R and D-to-patents relationship (Pakes-Griliches, 1980; and Hausman-Hall-Griliches, forthcoming) to a larger but shorter panel of firms. Using both nonlinear least squares and Poisson-type models to treat the problem of discreteness in the dependent variable, the paper tries to discern in greater detail the lag structure of this relationship. Since the available time series are short, we pursue two different approaches to solve the lag truncation problem: in the first, the influence of the unseen past is assumed to decline geometrically; in the second, the unobserved past series are assumed to have followed a low-order autoregression. Neither approach yields strong evidence of a long lag. The available sample, although numerically large, turns out to be not particularly informative on this question. It does reconfirm, however, a significant effect of R and D on patenting (with most of it occurring in the first year or two) and the presence of rather wide and semi-permanent differences among firms in their patenting policies.

## **U.S. International Trade Policies in a World of Industrial Change**

**J. David Richardson**

Working Paper No. 1228  
November 1983  
JEL Nos. 420, 421, 422

This paper assesses the role of active trade policy in U.S. industrial change. The growing role of multinational corporations that are imperfectly competitive provides new arguments for a more active U.S. trade policy, as does an increased social consensus that governments should insure what markets do not. Arguments against a more active U.S. trade policy stem from: problems of manageability in a democratic system of checks and balances; its possible perception as a form of policy aggression; and, the likelihood that there are feasible alternatives with smaller costs of implementation, administration, incentives, and resource-diversion. Among such promising alternatives are government adjustment programs, intervention in the foreign exchange market, and macroeconomic renovation.

Sections 2 and 3 of the paper describe how international economic and policy environments encourage industrial change and pressure U.S. trade policy. Section 4 describes the pros and cons of more active U.S. trade policy where imperfectly competitive industrial structure and missing insurance markets are taken as facts of life. Section 5 assesses alternatives to more active U.S. trade policy, including, in addition to those mentioned above, strict reliance on market forces.

## **The Social Cost of Labor and Project Evaluation: A General Approach**

**Raaj Kumar Sah and Joseph E. Stiglitz**

Working Paper No. 1229  
November 1983  
JEL No. 323

This paper develops a general methodology for analyzing shadow wage (and other shadow prices). Our approach is to identify those reduced-form relationships that describe the economy and are central to the determination of the shadow wage, and to use these to obtain simple formulas for the shadow wage. We focus on such aspects of the economy as: (1) the difference between the domestic price and international prices; (2) the equilibrating mechanisms in the economy; (3) the mechanisms that determine earnings of industrial and agricultural workers; (4) the nature of migration; and (5) the intertemporal trade-offs and the attitudes toward inequality.

We model these aspects in a general manner that can be specialized to a number of alternative hypotheses concerning technology, behavioral postulates, and institutional settings. Most earlier results on the shadow wages are derived as special cases of our formulas. In addition, we identify a number of new qualitative results concerning the relationship between the shadow wage and the market wage.

## Exchange Rate Dynamics

**Maurice Obstfeld and Alan C. Stockman**

Working Paper No. 1230

November 1983

JEL No. 431

This paper discusses the dynamic behavior of exchange rates, focusing both on the response of exchange rates to exogenous shocks and on the relation between exchange rate movements and movements in important endogenous variables such as prices, interest rates, output, and the current account. We study aspects of exchange rate dynamics in a variety of models, some of which are based on postulated supply and demand functions for assets and goods, and some of which are based on explicit, individual utility-maximizing problems. Section 1 surveys the terrain. Section 2 explores the simplest model in which the relation among the exchange rate, price levels, and the terms of trade can be addressed—a flexible-price, small-country model in which wealth effects are absent and domestic and foreign goods are imperfect substitutes. Section 3 introduces market frictions so that the role of endogenous output fluctuations can be studied. Both sticky-price models and alternative market-friction models are discussed. Section 4 studies the link between the accumulation of foreign assets and domestic capital and the exchange rate. Section 5 examines deterministic and stochastic models in which individual behavior is derived from an explicit intertemporal optimization problem. Finally, Section 6 offers concluding remarks.

## Food Stamps as Money and Income

**Daniel S. Hamermesh and James M. Johannes**

Working Paper No. 1231

November 1983

JEL Nos. 911, 311

Food Stamps represent nearly \$11 billion of personal income in the United States. These coupons represent

the purchasing power available to their recipients and are reserves for the commercial banking system. This study asks how closely these coupons are substitutable for what is usually considered money and how well Food Stamps function as a fiscal stabilizer (that is, whether they increase consumption more than ordinary income does). Based on estimates for 1959–81, the results suggest that Food Stamp coupons are perfectly substitutable for M1. (We calculate a revised money supply series, including “Food Stamp Money,” in an appendix.) Estimates of consumption functions indicate that the marginal propensity to consume income in the form of Food Stamps is higher than that of ordinary income. Taken together, the results suggest that the Food Stamp program is an automatic fiscal and monetary stabilizer—under its provisions, both the money stock and disposable income increase during a recession.

## The Theory of Optimum Deficits and Debt

**Willem H. Buiter**

Working Paper No. 1232

November 1983

JEL Nos. 310, 320

This paper surveys a number of neoclassical and neo-Keynesian approaches to government financial policy. After reviewing the very restrictive conditions under which financial policy is a veil without real consequences, I analyze nonneutral financial policy in neoclassical models. At full employment, the substitution of borrowing for lump-sum taxes in a closed economy crowds out private capital formation. Government financial policy can be used to implement schemes for the optimal distribution of intertemporal risk. In the presence of distortionary taxes, the smoothing of tax rates over time may be optimal even where this involves systematic and predictable departures from balance in the budget.

I also restate the case for deficit finance and the operation of automatic fiscal stabilizers in a Keynesian world with disequilibrium in labor and output markets. The case for any kind of active financial policy rests on the presence of imperfections in the capital market (including incomplete contingent forward markets, such as insurance markets), on the longevity of the institution of government, and on the government's unique ability to tax.

Finally, I analyze certain long-run aspects of the fiscal and monetary stance. These include their sustainability, that is, the consistency of long-term spending and taxation plans with the monetary objectives and the crowding-out targets. The concepts of the comprehensive net worth of the public sector and its permanent income are central to this analysis. The current U.K. position appears to be one of an unsustainable “permanent surplus.”

## **Openness, Relative Prices, and Macro Policies**

**Joshua Aizenman**

Working Paper No. 1233

November 1983

JEL No. 430

This paper analyzes the role of relative prices in the conduct of wage indexation and monetary policy in a small economy that produces both traded and non-traded goods under a flexible exchange rate regime. I show that the beneficial effect of using relative as well as aggregate prices as indicators for the conduct of wage and monetary policies increases with openness. The response of policies to relative prices rises with openness and has dampening effects on the volatility of deviations from purchasing power parity. The analysis demonstrates that the beneficial effect of allowing a "basket" indexation (or a money rule that also responds to relative prices) lies in mitigating the effects of foreign shocks.

## **Public Opinion and the Balanced Budget**

**Alan S. Blinder and Douglas Holtz-Eakin**

Working Paper No. 1234

November 1983

JEL No. 300

While most Americans have long favored a balanced federal budget, not all do. This paper uses cross-sectional differences among respondents to two public opinion polls to try to discriminate among competing hypotheses about why Americans want the budget balanced. We fit logit models to data from two public opinion polls: a Gallup poll and a CBS/*New York Times* poll conducted, respectively, in March and April of 1980, a time when the proposed balanced budget amendment to the Constitution was very much in the news.

In each case, a large majority favored a balanced budget requirement. However, they favored it for a smorgasbord of reasons and at an unclear price. It appears that political affiliation, ideology, and personal circumstances are far less important determinants of the choice than are economic rationales.

## **Inflation and Growth**

**Stanley Fischer**

Working Paper No. 1235

November 1983

JEL No. 310

Models of inflation and growth in the 1960s emphasized the portfolio substitution mechanism by which

higher inflation made capital more attractive to hold relative to money, leading to higher capital intensity and, in the transition period, to higher growth. The empirical evidence, however, is that growth and inflation are negatively correlated. I investigate reasons for this negative correlation and then embody them in a simple monetary-maximizing model. Higher inflation is associated with lower growth because lower real balances reduce the efficiency of factors of production, and because there may be a link between government purchases and the use of the inflation tax. I analyze comparative steady states and comparative dynamics and demonstrate the generally negative association between inflation and growth, both in steady states and in transition processes.

## **Optimal Trade and Industrial Policy under Oligopoly**

**Jonathan Eaton and Gene M. Grossman**

Working Paper No. 1236

November 1983

In this paper we provide an integrative treatment of the welfare effects of trade and industrial policy under oligopoly and qualitatively characterize the form that optimal intervention takes under a variety of assumptions about the number of firms, their conjectures about the response of their rivals to their actions, the substitutability of their products, and the markets in which they are sold. We find that when no domestic consumption occurs, optimal policy under duopoly with a single home firm depends on the difference between firms' actual responses to their rivals and the response that their rivals conjecture. If conjectures are consistent, free trade is optimal. A tax or subsidy is indicated depending on the sign of the difference between the conjectured and the actual response. With more than one home firm but still no domestic consumption, an export tax is indicated if conjectures are consistent. Production subsidies and export tax-cum-subsidies can raise national welfare in the presence of domestic consumption, because these policies can mitigate the extent of the consumption distortion implicit in the deviation of price from marginal cost.

## **A Structural Retirement Model**

**Alan L. Gustman and Thomas L. Steinmeier**

Working Paper No. 1237

November 1983

The model we analyze here constrains most work on the main job to be full time. Partial retirement requires

a job change and a wage reduction. Estimates of parameters of utility functions and their distributions incorporate information on age of leaving the main job and of full retirement. These estimates determine the slope at different ages and the convexity of within-period indifference curves between compensation and leisure. Even though we do not use age-specific dummy variables, the model closely tracks retirement behavior. We show that policy analysis based on earlier models with simpler structures is misleading.

### **Does Knowledge Intensity Matter? A Dynamic Analysis of Research and Development Capital Utilization and Labor Requirements**

**M. Ishaq Nadiri and Jeffrey I. Bernstein**  
Working Paper No. 1238  
November 1983

In this paper we develop a dynamic analysis of a firm undertaking research and development (R and D) investment and physical capital accumulation and utilization along with decisions on labor requirements. Empirical work has found that there are significant costs to developing knowledge. Consequently, R and D capital is treated as a quasi-fixed factor, along with the traditional physical capital stock.

A number of empirically relevant implications arise from the analysis. We show that along the dynamic path as the R and D intensity of physical capital increases, knowledge per worker rises and the utilization rate of physical capital decreases. We distinguish between the intertemporal movement of the firm and the response to unanticipated changes in demand and cost conditions. An increase in product demand causes the firm to increase both the R and D growth rate and the labor intensity of R and D capital. Contrary to a viewpoint held by many, the R and D investment does not displace labor. Finally, our model provides a framework to justify the empirically observed direct relationship between the physical capital growth and utilization rates.

### **Uncertainty, Welfare Cost, and the "Adaptability" of U.S. Corporate Taxes**

**Don Fullerton and Andrew B. Lyon**  
Working Paper No. 1239  
November 1983  
JEL No. 323

Alternative corporate tax systems differ in their ability to adapt to changes in the rate of inflation. Absent complete indexing of depreciation allowances, a tax

system may use the expected inflation rate to set accelerated depreciation allowances in a way that minimizes the welfare loss from the misallocation of capital. This welfare loss is a nonlinear function of the assumed inflation rate, however, so the welfare loss at the expected inflation rate may be quite different from the expected welfare loss. We compute these two welfare concepts for each of three alternative corporate tax schemes in the United States and for two different relationships between inflation and interest rates. One important finding is that the Auerbach-Jorgenson first-year recovery plan is not equivalent to indexing as is often claimed, if uncertainty about inflation implies uncertainty about the real aftertax discount rate.

### **Antidiscrimination or Reverse Discrimination: The Impact of Changing Demographics, Title VII, and Affirmative Action on Productivity**

**Jonathan S. Leonard**  
Working Paper No. 1240  
November 1983

Opponents of the integration by race and gender of the American work place have argued that forced equity will entail reduced productivity as employers are forced to hire lower-quality females and minorities. The numerous wage equation studies always reach the same dead end: residual differences across race or gender are either caused by discrimination or by unobserved quality differences. This study takes a new approach and directly estimates over time the ratio of minority to white male productivity, and of female to white male productivity, using a new two-digit SIC industry-by-state production function data set for 1966 and 1977. The major finding is that there is no significant evidence that the productivity of minorities or females decreased relative to that of white males as relative minority and female employment increased during the 1960s and 1970s. This study also presents evidence that Title VII litigation has played a significant role in increasing black employment. This suggests that the employment of minorities and females has not entailed large efficiency costs and that Title VII litigation has had some success in fighting racial discrimination. Direct tests of the impact of Title VII litigation and affirmative action regulation also find no significant evidence that these policies have contributed to a reduction in productivity.

## **Taxation and the Location of U.S. Investment Abroad**

**David G. Hartman and Daniel J. Frisch**

Working Paper No. 1241

November 1983

JEL Nos. 323, 441, 442

Tax policy toward the overseas income of U.S. firms is an important issue since foreign investment accounts for a sizable fraction of total investment by U.S. firms. At present there is no consensus on the degree to which U.S. firms respond to tax incentives when making international investment decisions. This paper seeks to shed light on this issue.

Because the tax systems of (at least) two countries are involved, the specification of tax incentives is far from trivial. For example, U.S. treatment is based on the foreign tax credit mechanism. In its purest form, this mechanism would ensure that the net tax rate on all income of U.S. firms would be equal to the U.S. tax rate, rendering the tax rates in the host countries irrelevant.

In fact, actual U.S. tax practice is far removed from an idealized foreign tax credit mechanism. For instance, the U.S. tax is not collected until income is repatriated from abroad; Section I points out that deferral changes the incentive effects in fundamental ways. Foreign income tax rates definitely do matter in theory; in fact, they may be of overriding importance.

The remainder of the paper seeks to test these theoretical considerations. First, we describe the cross-section data that were collected for this purpose. Then, we report the result that U.S. firms respond to net rates of return in general and to properly specified tax rates in particular.

## **International Capital Mobility and the Coordination of Monetary Rules**

**Nicholas Carlozzi and John B. Taylor**

Working Paper No. 1242

December 1983

JEL No. 300

The paper develops a two-country model, with flexible exchange rates and perfect capital mobility, for evaluating the alternative macroeconomic policy rules. Macroeconomic performance is measured in terms of *fluctuations* in inflation and output. Expectations are rational, and prices are sticky; wage setting is staggered over time. The countries are linked by aggregate spending effects, relative price effects, and markup pricing arrangements. We solve and analyze the model through deterministic and stochastic simulation techniques.

The results suggest that international capital mobility is not necessarily an impediment to efficient domestic macroeconomic performance. Changes in the *expected* appreciation or a depreciation of the exchange rate along with differentials between *real* interest rates in the two countries can permit macroeconomic performance in one country to be relatively independent of the policy rule chosen by the other country. The results depend on the particular parameter values used in the model and suggest the need for further econometric work to determine the size of these parameters.

## **The Forecasting Ability of Money Market Fund Managers and Its Economic Value**

**Alex Kane and Young Ki Lee**

Working Paper No. 1243

December 1983

JEL No. 521

We adapt the model proposed by Merton (1981) to determine the value of forecasting ability in investigating whether money market fund managers successfully anticipate changes in the yield curve by adjusting the average maturity of their portfolios in the correct direction. We further assess the potential economic value of such behavior and show that if the portfolios of all money market funds were aggregated it would appear that managers are good forecasters even if individually they possess insignificant forecasting ability. At the same time, the economic value of the aggregate portfolio will be diminished because of the reduced net change in average maturity. Thus, diversifying into many money market funds will not attain the gain that could be realized if an individual manager had a forecasting ability equal to the quality of the average forecast.

We investigate a sample of 34 money market funds. Analysis suggests that a small fraction of the funds exhibited forecasting skills, but even they generated negligible economic value because the changes in the average maturity of their portfolios were too small. There appears to be no relationship between forecasting ability and economic success of money market funds as measured by asset size and growth.

## **Activist Monetary Policy, Imperfect Capital Mobility, and the Overshooting Hypothesis**

**David H. Papell**

Working Paper No. 1244

December 1983

JEL No. 430

I investigate the hypothesis of exchange rate overshooting in the context of a model that incorporates

activist monetary policy, variable output, imperfect capital mobility, and slow price adjustment. The paper shows that monetary policy that accommodates prices and/or interest rates increases the likelihood of undershooting. Using constrained maximum likelihood methods, I estimate the model for Germany and Japan since the advent of generalized floating in 1973. Based on the estimated parameter values, the mark exhibits overshooting while the yen is characterized by undershooting. The constraints implied by the model cannot (by likelihood ratio tests) be rejected at standard significance levels for either country.

## **The Welfare Effects of Trade and Capital Market Liberalization: Consequences of Different Sequencing Scenarios**

**Sebastian Edwards and Sweder van Wijnbergen**  
Working Paper No. 1245  
December 1983

This paper deals with the dynamics of liberalization of trade and capital accounts in a developing country. It investigates the welfare consequences of such liberalization under alternative sequencing scenarios. We draw on standard trade theory results to show that the opening of the capital account in the presence of trade distortions may reduce welfare if foreign borrowing is used to increase investment. However, we demonstrate that this welfare-reducing effect of opening the capital account will not occur if shadow prices are used to guide investment decisions.

We then show that if capital market restrictions fall disproportionately on investment (as opposed to consumption), a *gradual* reduction of import tariffs is superior to an abrupt trade liberalization.

## **The Effects of Interest Rates on Mortgage Prepayments**

**Jerry R. Green and John B. Shoven**  
Working Paper No. 1246  
December 1983

Three main types of mortgages are: fixed interest contracts that automatically fall due on the sale of a dwelling; fixed rate loans that are assumable by a buyer; and floating rate instruments. When interest rates rise, the fall in the economic value of mortgage assets in savings and loan associations' portfolios varies from one form of mortgage to another. For either of the fixed interest rate contracts, the cash flow from the mortgage is constant as long as it has not been prepaid. If the interest rate rises, the homeowner has a nominal capital gain, since his loan is then at below market interest rate.

He would therefore be less likely to prepay. The fall in the savings and loans' net worth arises from two factors: (1) the interest rate differential for mortgages of a fixed duration, and (2) the endogenous lengthening of the duration.

This paper is an attempt to measure the dependence of the duration of mortgages on the implicit unrealized capital gain of mortgage holders resulting from interest rate changes. Our estimate is based on a sample of 4000 mortgages issued in California that were active in 1975. We follow their payment history from 1975 to 1982. Using a Proportional Hazards Model, we estimate the percentage reduction in prepayment probability associated with interest rate changes. Our results indicate that for due-on-sale fixed interest rate mortgages, a sudden increase in the interest rate from 10 to 15 percent would induce a 23 percent loss in the economic value of the mortgage. If the mortgage were assumable, the loss would be 28 percent. Correspondingly, the six-year average time for repayment of mortgages at a constant interest rate would be lengthened to nine years for due-on-sale mortgages, and 13½ years for assumable ones.

## **The Economics of Saving**

**Mervyn A. King**  
Working Paper No. 1247  
December 1983  
JEL Nos. 022, 023, 211, 320

This paper analyzes recent contributions to the theory of household saving and examines empirical evidence on the subject. It focuses on: (1) the derivation and estimation of first-order conditions for a consumer's optimum life-cycle consumption plan; (2) the conditions under which such conditions may be used to derive an aggregate consumption function; (3) the relationship between constraints in labor and cyclical markets and the notion of a "representative consumer" in macroeconomic models; and (4) the extent to which existing empirical evidence lends support to a life-cycle model of consumer behavior. Finally, I propose further empirical tests.

## **Earnings and Dividend Announcements: Is There a Corroboration Effect?**

**Alex Kane, Young Ki Lee, and Alan Marcus**  
Working Paper No. 1248  
December 1983  
JEL No. 521

We examine abnormal stock returns surrounding announcements of contemporaneous earnings and dividends in order to determine whether investors evaluate the two announcements in relation to each other.

We find that there is a statistically significant effect of interaction. The abnormal return corresponding to any earnings or dividend announcement depends upon the value of the other announcement. This evidence suggests the existence of a corroborative relationship between the two announcements. Investors give more credence to unanticipated dividend increases or decreases when earnings are also above or below expectations, and vice-versa.

### **Trade Unions and Productivity: Some New Evidence on an Old Issue**

**Richard B. Freeman and James L. Medoff**  
Working Paper No. 1249  
December 1983

This paper summarizes some new evidence on the impact of collective bargaining on productivity for workers of a given quality using the same amount of capital. The new findings based on econometric investigations indicate that in many sectors, particularly manufacturing and construction, unionized work places are more productive on average than those that are nonunion. This positive effect of unions on productivity is not an immutable constant. For example, in the underground bituminous coal industry, unionized mines were significantly less productive than nonunion mines in 1975 although they had been significantly more productive in 1965.

The routes by which unions affect productivity have not yet been delineated carefully, and they appear to differ from sector to sector. In manufacturing, reduced turnover and improved management seem to be key; in construction, better trained workers and more rational hiring and supervision seem to be primary.

Finally, while the union/nonunion productivity differential is likely to be positive, on average it is not large enough to offset the greater compensation and capital intensity under unionism. Hence, higher productivity and lower profitability appear to go hand in hand under collective bargaining.

### **Annuity Markets, Savings, and the Capital Stock**

**Laurence J. Kotlikoff, John B. Shoven, and Avia Spivak**  
Working Paper No. 1250  
December 1983  
JEL No. 321

This article examines how the availability of annuities affects savings and inequality of individual welfare in economies in which neither private nor public pen-

sions exist initially. The absence of widespread market or government annuity insurance is clearly descriptive of many less developed countries in the world today; it was also a characteristic of virtually all countries prior to World War II. The paper compares economies having perfect insurance with economies in which completely selfish parents and children pool longevity risk to their mutual advantage. The analysis of the latter economies takes into account the infinite sequence of risk-sharing bargains of successive parents with their children. Such bargains affect current risk sharing between parents and child because they determine the welfare of current children when they become parents. Calculations based on the CES utility function indicate that perfecting annuity insurance can significantly reduce national savings. Indeed, the insurance aspects of government pensions are potentially as important as underfunding government pensions in reducing national savings.

### **Life-Cycle Labor Force Participation of Married Women: Historical Evidence and Implications**

**Claudia Goldin**  
Working Paper No. 1251  
December 1983  
JEL No. 820

The fivefold increase in the labor force participation rate of married women over the last half century was *not* accompanied by a substantial increase in the average job market experience of working women. Two data sets giving life-cycle labor force histories for cohorts of women born from the 1880s to 1910s indicate substantial (unconditional) heterogeneity in labor force participation. Married women in the labor force had a high degree of attachment to it; increased participation rates brought in women with little prior job experience and reduced cumulated years of experience. According to extant schedules from a 1939 Women's Bureau Bulletin, 86 percent of married women born around 1895 and working in 1939 had been employed 50 percent of the years since beginning work, and 47 percent had worked 88 percent of those years. Average years of experience for cross-sections of working married women hardly increased from 1920 to 1950, rising from 9 to 10.5 years. Because wages are calculated only for currently employed individuals, the steadiness in relative wages of women to men over this period may result from stable experience ratings for employed married women. An

exploration of the determinants of labor force persistence points to the importance of occupational choice early in the work history of a woman and to the rise in clerical and professional occupations in extending life-cycle labor force participation.

### **Costs and Benefits of an Anti-Inflationary Policy: Questions and Issues**

**Willem H. Buiter and Marcus M. Miller**

Working Paper No. 1252

December 1983

JEL Nos. 134, 431

This paper analyzes how the output or unemployment cost of achieving a sustainable reduction in the rate of inflation depends on the structure of the wage-price process. We also consider how the "sacrifice ratio" can be minimized. In models where the natural rate of unemployment is invariant under anti-inflationary policies, price level inertia is not sufficient for a positive sacrifice ratio. Without sluggishness in the core inflation rate, a zero sacrifice ratio can be achieved simply through intelligent demand management. With sluggish core inflation, the sacrifice ratio is positive unless intelligent demand management is complemented by cost-reducing fiscal measures or effective incomes policy. Letting the exchange rate float does not reduce the sacrifice ratio. If core inflation is partly backward looking and partly forward looking, current core inflation may be a function of current and past expectations of future recessions. Conventional calculations of the sacrifice ratio ignore forward-looking aspects of behavior and may therefore underestimate the true cost of disinflation. If there is hysteresis in the natural rate (for example, through a gradual adjustment of the natural rate toward the actual rate) and if there is sluggish core inflation, the sacrifice ratio will become infinite.

Whenever sluggish core inflation is present, credibility of the anti-inflationary (monetary) policy alone cannot obviate a positive sacrifice ratio.

### **Tariff Liberalization Policy and Financial Restrictions**

**Joshua Aizenman**

Working Paper No. 1253

December 1983

JEL Nos. 420, 430

The purpose of this paper is to assess how restrictions on capital mobility affect adjustment to a policy

of tariff liberalization. This is done by comparing the adjustment process under free and restricted convertibility of foreign assets in a regime where the commercial exchange rate is pegged. I show that, in the short run, trade liberalization causes a larger drop in domestic goods prices and a smaller current account deficit in a regime with restricted convertibility than otherwise. Similar results apply for the current account effects of the liberalization in the long run: they are smaller under financial restrictions than otherwise.

### **Imported Materials Prices, Wage Policy, and Macroeconomic Stabilization**

**Richard C. Marston and Stephen J. Turnovsky**

Working Paper No. 1254

December 1983

JEL No. 430

This paper analyzes two simple wage rules that keep employment constant when there are shocks to the prices of imported materials. One rule ties nominal wages to the GNP deflator rather than the consumer price index. The second rule, followed by Japan after the second oil price shock, ties the real wage to real GNP. The paper shows the effects on output, real income, and other macroeconomic variables, of choosing either rule in place of the real wage stability provided by conventional wage indexation.

### **Real Exchange Rate Effects of Fiscal Policy**

**Jeffrey Sachs and Charles Wyplosz**

Working Paper No. 1255

January 1984

JEL No. 431

This paper develops a framework for analyzing the effects of fiscal policy on the real exchange rate. We consider the short-run impact of various types of fiscal measures as well as the dynamics of adjustment to long-run steady states. The analysis and related simulations suggest that the effect of fiscal policy changes on the real exchange rate can vary widely and will depend closely on a number of structural features, including the degree of asset substitutability, the composition of government spending, and the initial size of the public debt and net external position.

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