NBER Reporter

NATIONAL BUREAU OF ECONOMIC RESEARCH, INC.   SUMMER 1979

Program Report

Business Taxation and Finance

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Research in NBER's Program in Business Taxation and Finance covers a very broad range of individual projects. While the program stresses taxation rather than finance, tax consequences depend so strongly on financial structure—as, for example, in the choice between corporate and noncorporate forms of business organization—that research on business taxation must inevitably address issues of finance.

In general terms, the objective of the program is to provide quantitative information that can be useful in predicting the effects of alternative tax institutions on the accumulation of productive capital, the allocation of capital to various uses, and the distribution of the yield on corporate capital. Bureau researchers are involved in such related questions as:

1. What investment strategies and replacement decisions are optimal for a firm or industry?
2. What is the impact of inflation on share prices, real corporate profits, effective corporate tax rates, and investment decisions?
3. How does tax policy affect corporate financial structure, particularly the firm's reliance on debt and equity finance and its dividend pay-out ratios?
4. How would the integration of the personal and corporate income tax change resource allocation, income distribution, and corporate financial policy?
5. How does tax policy influence the allocation of investment resources between business and household (especially housing) sectors?
6. Can one simulate the effects of alternative tax changes on business and personal tax liabilities?

These individual research concerns are grouped into broader areas, such as the analysis of capital formation and the role of debt and equity finance in the U.S. econ-

This issue of the **Reporter** highlights the Bureau's program of research on business taxation and finance. Next Wilbur Lewellen summarizes his work on the individual investor in the securities market, Robert Hall analyzes the relationships between workers and employers in the labor market, and Martin Feldstein examines the impact of the social security system on private saving. Following the two quarterly Economic Outlook Surveys are a section of biographical sketches, news of NBER conferences, and other NBER news and reports. Short summaries of recent NBER Working Papers constitute the final section of the **Reporter**.

omy, that span several NBER research programs. A short synopsis of current NBER research in some of these areas is given below.

Taxation and Inflation

The Bureau's work on the effects of inflation on corporate and individual tax burdens is one critical element in the business taxation and finance program. After an extended period of high inflation, U.S. policy makers have begun to realize some of the shortcomings that result from basing income tax liabilities on historical cost-accounting methods. Tax burdens are influenced by the obvious tendency of inflation to push individual taxpayers into successively higher marginal rate brackets. But in addition, inflation creates severe problems associated with the measurement of income from capital, especially (1) capital gains, since the sale price of securities is in current dollars and the purchase price is in more valuable past dollars; (2) depreciation, where al-

lowances are based on the past purchase price of an asset; and (3) gains and losses on holdings of financial liabilities and assets.

While methods exist that deal with the measurement problems alone (Bureau Research Associate John Shoven has been a major contributor to developing such methods[1]), finding a comprehensive solution is extremely complex and difficult. Yet partial solutions, which could be more easily implemented, encounter political resistance on the ground that it is unfair to correct the situation for some taxpayers and not for others.

It is argued, for example, that one should not adopt indexing of capital gains and depreciation, a relatively simple step, without also correcting for gains and losses in dollar-denominated financial assets. Economists understand, however, that the rewards for holding financial assets are related to the returns on real assets, so that a correction in the accounting methods for returns on real assets would lead, through market adjustments, to an increase in returns on nominally-denominated assets. In fact, theory predicts that the adjustment would be just right—holders of financial assets would be compensated for inflation *and* for the tax due on the inflation premium—in a system where everyone faces the same marginal tax rate.

However, we do not live in a world of uniform tax rates. Bureau President Martin Feldstein and fellow Bureau researchers Jerry Green and Eytan Sheshinski have extended the analysis to a more general tax rate system and have shown how the rate of inflation affects the structure of returns to real and financial wealth if only real yields are corrected for inflation.[2]

In related work, Feldstein and Lawrence Summers have explored the quantitative relationship between interest rates and inflation in the present system, where real returns are *not* indexed.[3] Using the device of a "standard investment project" to which actual tax rules can be applied, they show that the increased tax burden on real returns that is due to the failure to index offsets the premium investors would otherwise be prepared to offer those who lend on nominal terms. Therefore, the predicted effect of inflation on the interest rate is roughly a one-for-one adjustment. That is, an extra percentage point on the rate of anticipated inflation leads to an extra percentage point on the long-term interest rate in the market. Among other things, this finding, which rationalizes an observed regularity that should be expected in a world without taxes but not in a world with an income tax, provides a natural way to characterize the incidence of the tax effects of inflation.

Present income measurement rules cause the tax burden on different forms of asset yields to vary with the

[1] *J. Shoven and J. I. Bulow, "Inflation Accounting and Non-Financial Corporate Profits," Brookings Papers on Economic Activity, No. 3 (1975), and No. 1 (1976).*

[2] *M. Feldstein, J. Green, and E. Sheshinski, "Inflation and Taxes in a Growing Economy with Debt and Equity Finance," Journal of Political Economy (supplement, April 1978).*

[3] *M. Feldstein and L. H. Summers, "Inflation, Tax Rules, and the Longer Term Interest Rate," NBER Working Paper No. 232, February 1978.*

rate of inflation. Feldstein's work explains two related phenomena: (1) the relatively poor performance of common stocks as an inflation hedge in recent years and (2) the relatively high yields received by holders of real estate and gold. At high inflation rates, the effective tax rate on corporate capital is high. Stocks tend to lose relative value as the inflation rate rises. Stocks also suffer the double tax burden disadvantage of overstated, inflated capital gains and understated depreciation measurement, while real estate and gold are subject only to defective capital gains measurement. As a result, an increase in the inflation rate causes real estate and gold to rise relative to stocks.

Bureau researchers have also collaborated on efforts to measure other inflation-induced changes in tax burdens. Feldstein and Joel Slemrod, using a Treasury Department sample of over 30,000 individual tax returns for 1973, estimated the difference between capital gains taxes that were calculated by using the historical purchase-cost basis and capital gains taxes that would have resulted after adjusting for price level changes since the date of acquisition. They found that in 1973 capital gains taxes were paid on $4.6 billion. Whereas, had the cost of the taxable shares been adjusted for inflation, there would have been a capital *loss* of nearly $1 billion.[4]

In another study based on flow of funds accounts, Feldstein and Summers estimate the applicable tax rates on various channels by which income from corporate capital flows to its ultimate beneficiaries, bond holders and direct and indirect stockholders.[5] In this study, they consider not only the tax paid by the corporations themselves but also the tax paid by the individuals and institutions that provide capital to the corporate sector. They conclude that inflation caused an increase in the effective tax rate in 1977 from 43 to 66 percent of capital income in the nonfinancial corporate sector.

Analysis of Major Tax Alternatives

Bureau researchers have also been investigating the effects of two major strategies of tax change that have been under active discussion in recent years. One, integration of corporation and individual income taxes, has been adopted in some form in many countries and has been advocated for the United States by tax policy makers of both political parties. NBER Vice President Charles McLure has written extensively on this subject, including a book[6] and working papers[7] devoted to the details of implementation of alternative integration plans. More

recently, he has been concerned with the international aspects of dividend relief and the related subject of the implications of integration of state and local income taxes.

The second major change in the taxation of capital income that is under study in the program is a shift from an income to an expenditure base for taxes. This notion has attracted the interest of economists at least since the time of John Stuart Mill, but has normally been regarded solely as an academic issue. However, it recently surfaced as a serious alternative for the United States in the Treasury's *Blueprints For Basic Tax Reform*, and it was advocated for the United Kingdom in a report made last year by a committee chaired by Professor James Meade.

Additionally, there has been renewed interest in the value-added tax, a flat-rate version of an expenditure-based tax. Summers has used the setting of a life cycle model of household savings to compare income taxes to different forms of expenditure taxes.[8] His simulations suggest the potential for major efficiency gains through a shift to expenditure-based taxes. His work also suggests that the capital formation effects of such a shift will be sensitive to the particular form in which it is implemented.

Broadly speaking, a change to an expenditure base that is achieved by exempting investment yields from an otherwise conventional income tax will be less conducive to capital formation than an approach that, in effect, extends the present treatment of pension savings to all forms of investment. This conclusion depends, however, upon restricting the government to cash flow budget balance, and thereby emphasizes the potentially crucial role of fiscal policy in capital formation.

Summers's further conclusion, of considerable practical importance, is that an appropriate combination of tax changes leading to an expenditure base can be found that will benefit all taxpayers. Typical analyses had previously led to the conclusion that it would be very difficult to avoid imposing losses on one group or another in making a transition to an expenditure base.

Real Allocation Effects of Taxes

There are a variety of ways in which taxes influence the allocation of real economic resources. Summers's work on the capital formation consequences of the choice between income and expenditure tax bases points out one possible outcome. David Bradford has analyzed the biases introduced to the choice of capital durability by the rules relating the amount of investment credit to the useful life of the asset acquired.[9] Alan Auerbach has looked at the effect of inflation on the same aspect of investment choice.[10] Research Associate Patric Hendershott is looking at the impact of a broad range of institutional changes—such as adjustments in the corporate tax rate, changes in the

[4] M. Feldstein and J. Slemrod, "Inflation and the Excess Taxation of Capital Gains on Corporate Stock," NBER Working Paper No. 234, February 1978.

[5] M. Feldstein and L. H. Summers, "Effects of Inflation on the Taxation of Capital Income in the Corporate Sector," NBER Working Paper No. 312, January 1979.

[6] C. E. McLure, Jr., Must Corporate Income Be Taxed Twice? (Washington, D.C.: Brookings Institution, 1979).

[7] J. G. Ballentine and C. E. McLure, Jr., "Taxation and Corporate Financial Policy," NBER Working Paper No. 243, May 1978; C. E. McLure, Jr., "A Status Report on Tax Integration in the United States," NBER Working Paper No. 298, November 1978, also in National Tax Journal (December 1978): 313–28; and C. E. McLure, Jr., "International Aspects of Dividend Relief," NBER Working Paper No. 317, February 1979.

[8] L. H. Summers, "Tax Policy in a Life Cycle Model," NBER Working Paper No. 302, November 1978.

[9] D. F. Bradford, "Tax Neutrality and the Investment Tax Credit," NBER Working Paper No. 269, August 1978.

[10] A. J. Auerbach, "Inflation and the Choice of Asset Life," NBER Working Paper No. 253, July 1978.

coverage and rate of investment tax credit, integration of corporate and individual taxes, and a switch to replacement-cost depreciation—on the level and distribution of the U.S. capital stock.[11] In his work, Hendershott specifies a general equilibrium framework, which means that there can be no "free" increase in productive capacity. He attempts to use econometrically estimated investment demand and saving-supply relationships to simulate the effect of tax policy changes on investment in owner-occupied and rental housing, consumer and producer durables, and nonresidential structures. He is also concerned with the potential division of saving between government and the private sector.

The design and computation of general equilibrium models of the U.S. economy, with close attention to tax institutions, has also been a major research interest of John Shoven. He and his associates have already produced a considerable range of policy applications of medium-scale general equilibrium models for the U.S. Treasury.[12] In his work for NBER in this area, Shoven is analyzing the development of the U.S. economy through time in order to provide better answers to questions about the effect of tax choices on the long-term labor-capital ratio.

Michael Boskin and Larry Lau are studying the interaction of demographic and tax effects on aggregate wealth accumulation.[13] This project builds on Boskin's earlier work on the responsiveness of savings to rates of return.[14]

Harvey Rosen has completed a series of papers[15] on the effect of tax rules on investment in housing and, in particular, on the extent of home ownership. Rosen concludes that a significant, although by no means the only, explanatory variable in the growth of owner-occupied housing since World War II has been favorable treatment on individual income tax. He estimates that eliminating the deduction for mortgage interest and local real estate taxes from the federal income tax base would cause a reduction in owner occupancy from 64 percent to 59 percent, with an even more significant reduction in the quantity of housing chosen per owner-occupier. Rosen plans next to use both cross-sectional and longitudinal data to study the effect of taxes on the accumulation of another important form of wealth, human capital.

One allocative issue long of concern is the division of resources between corporate and noncorporate investment. The traditional approach to this issue is to regard the extra tax burden in the corporate sector as a differential tax on corporate capital. However, the advantage that is allowed to retained corporate earnings (at the personal tax level) may mean that the corporate tax system actually lowers the tax burden on corporate investment. Feldstein and Slemrod have shown that, for possible parameter values, the present system, as compared with a comprehensive personal income tax system, might actually lead to an *increase* in the fraction of the capital stock used in the corporate sector.[16] More plausible parameter values in their portfolio analysis imply the conventional conclusion that the existing system reduces the corporate capital stock, but by much less than is implied by the traditional analysis.

Feldstein and Slemrod have also investigated, both theoretically and empirically, the effect of taxation on the realization of capital gains in individual portfolios.[17] Their conclusion is that the rate of realization is quite sensitive to the rate of capital gains tax, so much so that in some circumstances the reductions in the tax rate could be expected to actually increase tax revenues.

The Effect of Tax Rules on Corporate Finance

Nearly all of the researchers associated with the Program in Business Taxation and Finance are exploring the ways in which the tax system influences corporate financial structure, especially the debt-equity balance, and the form of corporate distributions. Both Auerbach and Bradford have analyzed models in which all corporate distributions with respect to equity must be taxed as shareholder dividends.[18] While the details of their analyses differ, both researchers emphasize that the anticipated taxes due on dividend distributions result in retained corporate earnings being reflected at a rate less than dollar-for-dollar in increased share values. This being so, it may be that the presumed bias against dividends in the present system has been exaggerated.

Presently, corporate income is taxed initially at the corporate level and subsequently at the shareholder level, when it is distributed or reflected in increased equity value. Because the increased equity value is taxed at lower rates and only when realized, some analysts assume that there is an excessive incentive for corporations to retain earnings. However, if retained earnings increase equity value by less than a dollar per dollar, firms will

[11] For the initial stages of this analysis, see P. Hendershott, "The Relative Impacts of Various Proposals to Stimulate Business Investment," forthcoming in The Government and Capital Formation, ed. Von Furstenberg (Cambridge, Mass.: Ballinger Publishing Co., 1980).

[12] D. Fullerton, J. Shoven, and J. Whalley, "General Equilibrium Analysis of U.S. Taxation Policy," in Conference on Tax Research, 1977 (Washington, D.C.: Office of Tax Analysis, Department of the Treasury).

[13] M. Boskin and L. Lau, "The Effects of Taxes and Demographic Changes on Savings," paper to be presented at NBER Conference on the Taxation of Capital, November 16 and 17, 1979.

[14] M. Boskin, "Taxation, Saving and the Rate of Interest," Journal of Political Economy, April 1978.

[15] H. Rosen, "Housing Decisions and the U.S. Income Tax," Journal of Public Economics (February 1979); H. Rosen, "Owner-Occupied Housing and the Federal Income Tax," Journal of Urban Economics (April 1979); H. Rosen and K. Rosen, "Federal Taxes and Home Ownership: Evidence from Time Series," Journal of Political Economy, forthcoming.

[16] M. Feldstein and J. Slemrod, "Personal Taxation, Portfolio Choice, and the Effect of the Corporation Income Tax," NBER Working Paper No. 241, April 1978.

[17] M. Feldstein, J. Slemrod, and S. Yitzhaki, "The Effects of Taxation on the Selling of Corporate Stock and the Realization of Capital Gains," NBER Working Paper No. 250, June 1978; J. Slemrod and M. Feldstein, "The Lock-in Effect of the Capital Gains Tax: Some Time-Series Evidence," NBER Working Paper No. 257, July 1978.

[18] A. J. Auerbach, "Share Valuation and Corporate Equity Policy," NBER Working Paper No. 255, July 1978; D. F. Bradford, "The Incidence and Allocation Effect of a Tax on Corporate Distributions," NBER Working Paper No. 349, May 1979.

continue to pay dividends in order to maximize shareholder wealth.

Green and Bradford and Roger Gordon have all been attempting to empirically measure the extent of such "discounting" of retained earnings. Using data on prices and dividends of common stock traded on the New York Stock Exchange over a fifty-year period, Bradford and Gordon employ the capital asset pricing model,[19] in which investors are assumed to maximize a utility function (the arguments of which are the mean and variance of a weighted sum of capital gains and dividends). Under appropriate assumptions, the relative valuations of dividends in this weighted sum can be estimated from the stock market data, and this relative valuation represents the market price of retained earnings if firms are maximizing shareholder wealth. (Note that this market price is also the value of "Tobin's q," understood as the value in the market of marginal corporate investment. Bradford and Gordon's early results suggest that q has moved cyclically around one over the fifty-year period.)

Green is pursuing another approach to this issue: he is looking at the behavior of stock prices on ex-dividend day. In theory, if retained earnings are valued at less than a dollar per dollar, the fall in the price of a share on the day the stock goes ex-dividend should be less than the amount of the dividend.

While a value of q of less than one is compatible with corporate-maximizing behavior in the presence of taxes on corporate distributions, it appears that virtually tax-free distributions can be effected through stock repurchase (and to some degree by the related device of purchasing the shares of other corporations, taking advantage of the deduction of 85 percent of intercorporate dividends from the corporate tax base). This implies that the debt-equity balance should be struck with $q = 1$, and that we should not observe any ordinary dividends. The extent of observed dividend payments, given the alternative of the virtually zero-tax-distribution method, remains a puzzle that has attracted the continuing interest of Bureau researchers. Joseph Stiglitz is investigating one possibility: that dividends constitute a favored signal of the firm's financial health. The issue, therefore, is whether such a favored role could be sustained in a competitive, wealth-maximizing environment with dividends taxed heavily relative to alternative distribution routes.

Other associates of the Program in Business Taxation and Finance are also engaged in efforts to understand the determinants of corporate financial structure. For example, Shoven has done innovative work on the circumstances under which a corporation may be forced into bankruptcy,[20] and is continuing to analyze this determinant of the debt-equity balance. Stuart Myers is

exploring the implications for corporate security issues (and investment decisions) of the fact that firms have different information about their own prospects than the investors have about the securities of these firms. Auerbach and Mervyn King have shown in a simple model how the debt-equity ratio, in the aggregate, may depend upon personal and corporate tax rates and the attitudes of security purchasers toward wealth and risk.[21]

Taxes in an International Economy

There are three aspects to the Bureau's work on taxes in the international economy. The first is an analysis of the typical assumptions about tax effects in a closed economy, particularly with regard to capital accumulation. The second is research designed to increase our knowledge of the effect of tax rules that are specifically applicable to international transactions. Third is a plan to compare tax systems across countries.

Feldstein and Bureau Research Assistant Charles Horioka have investigated the extent of capital mobility by comparing rates of national saving with rates of national investment.[22] Their finding is that differences in saving rates are associated with virtually equal differences in investment rates. This supports the use of closed economy models in analysis of the capital formation effects of taxes.

Bureau Associate David Hartman has been actively involved in the second area, rules for international transactions.[23] In work with Feldstein, he has explored the issue of how a country "ought" to tax income earned abroad in order to benefit its own citizens.[24] This subject rather immediately and realistically raises game-theoretic issues, which are explicitly addressed in the Feldstein-Hartman work. Hartman is currently analyzing the effect of tax rules on the investment decisions of multinational corporations.

Finally, the Bureau plans a series of studies directed at understanding the taxation of savings yields in various countries. An effort will be made to develop comparable analysis, perhaps using selected Bureau studies of the U.S. system as the basic format. Mervyn King is already involved in such efforts in the United Kingdom; the Bureau hopes to establish similar projects in collaboration with Swedish and German economists.

[19] D. F. Bradford and R. Gordon, "Stock Market Valuation of Dividends: Links to the Theory of the Firm and Empirical Estimates," paper presented at NBER-SSRC Conference on Econometric Studies in Public Finance, June 13-16, 1979.

[20] J. Shoven and J. I. Bulow, "The Bankruptcy Decision," Discussion Paper No. 16, Stanford Workshop on the Microeconomics of Inflation, November 1977.

[21] A. J. Auerbach and M. A. King, "Corporate Financial Policy, Taxes, and Uncertainty: An Integration," NBER Working Paper No. 324, March 1979.

[22] M. Feldstein and C. Horioka, "Domestic Savings and International Capital Flows," NBER Working Paper No. 310, January 1979.

[23] D. G. Hartman, "Foreign Investment and Finance with Risk," Quarterly Journal of Economics (May 1979); D. G. Hartman, "Restriction of International Production: The Effects on the Domestic Economy," NBER Working Paper No. 307, December 1978; D. G. Hartman, "Taxation and the Effects of Inflation on the Real Capital Stock in an Open Economy," International Economic Review (June 1979); D. G. Hartman, "Deferral of Taxes on Foreign Source Income," National Tax Journal (December 1977).

[24] M. Feldstein and D. G. Hartman, "The Optimal Taxation of Foreign Source Investment Income," NBER Working Paper No. 193, August 1977.

Research Summaries

Studies of the Individual Investor

Wilbur G. Lewellen

The increasing concentration of common stock trading in the hands of institutional investors has been a concern of students of the American securities markets for a decade or more. The implications of that phenomenon for market liquidity and efficiency, for the supply of capital to firms, and for the brokerage community, have been much debated. Concurrently, the finance literature has been preoccupied with the question of whether portfolio strategies or securities-trading approaches exist that can produce superior investment performance in a market that generally seems to be characterized by "fair game" properties. Our studies of the individual investor have been motivated by an attempt to shed some additional light on these issues by examining the investment behavior and portfolio performance of a segment of the market that previously had not been subjected to careful analysis, primarily for lack of appropriate data. The following summary, based on research undertaken for NBER's Program in Financial Markets and Monetary Economics, reports certain of the findings that have emerged thus far. Those findings are based on data that cover the interval from 1964 through 1970.

The Investor Sample

The data were obtained from a large national retail brokerage house, and encompass all the securities transactions executed by a random sample of some 2,500 customers who had accounts continuously open with the firm over the period from January 1964 through December 1970. Approximately 300,000 transactions are included in the file, of which 200,000 involved common stocks; the latter have been the major focus of our analyses to date. The requirement of account longevity was imposed so as to allow a meaningful secular record of investment activity to be compiled for each individual. Fortunately, the sample does in fact span a wide spectrum of portfolio sizes and trading frequencies. Based on a questionnaire survey of the group, the sample also turns out to have demographic characteristics that correspond quite well to those of the broader population of American stockholders.[1] Thus, our feeling is that the sample is sufficiently diverse as to permit any significant cross-sectional differences in behavior and investment performance to be discerned, and is sufficiently representative to make our findings generally applicable to individual investors as a whole.

Investment Performance Measures

From the file of account transactions supplied by the brokerage house, together with the December 1970 bal-

ance statements for the accounts of the same customers, the beginning-of-month common stock portfolio positions were reconstructed for each of the individuals in the sample for all eighty-four months of the study period. By dollar value, a monthly average of approximately $40 million of open equities investment positions is covered by the data.

The monthly rates of return on each of those portfolios were then determined, using a supplemental file containing price, dividend, stock split, and stock dividend information for 1964-70 for the approximately 4,000 securities involved. The securities included all NYSE and ASE listed stocks, plus roughly 1,200 regional-exchange and OTC securities. Four rates of return were computed each month for every portfolio: a "raw" pretransactions-cost rate, a corresponding posttransactions-cost rate, a risk adjusted precost rate, and a risk adjusted postcost rate.

The first of these was obtained by summing: (1) the month's price changes for all securities held in the investor's portfolio throughout the month, (2) the difference between the proceeds received from any securities sold within the month and their beginning-of-month prices, (3) gains and losses on trades made entirely within the month, and (4) the cash dividends received during the month. This total dollar figure, divided by the portfolio's beginning-of-month market value, represents its unadjusted pretransactions-cost percentage rate of return for the month. The postcost counterpart thereof was arrived at by first subtracting the brokerage commissions, SEC fees, and transfer taxes paid on the month's trades (as recorded in the underlying transactions file) from the identified total return and then by dividing again by the beginning-of-month market value. Odd-lot price differentials were included as commission charges in this calculation.

The associated risk adjusted returns were defined as the differences between the indicated precost and postcost raw rates of return and those that were available during every month from naively selected, well-diversified portfolios of matching systematic risk. These benchmarks were derived from cross-sectional estimates of the risk-return relationship that prevailed in the equities market in each of the eighty-four months at issue, utilizing the "two-factor" version of the capital-asset-pricing model and monthly regressions on twenty portfolios encompassing all NYSE and ASE stocks grouped according to estimates of their betas made at a prior period.[2]

Portfolio Performance

From the rates of return thus computed, four summary measures of every sampled investor's overall investment experience for 1964-70 were obtained. These consist of the arithmetic averages of each of the four separate rate-of-return series determined for his or her portfolio over the eighty-four months examined. The individuals involved were then ranked from lowest to highest by each

[1] R. Lease, W. G. Lewellen, and G. Schlarbaum, "The Individual Investor: Attributes and Attitudes," Journal of Finance (May 1974).

[2] For the details see G. Schlarbaum, W. G. Lewellen, and R. Lease, "The Common-Stock-Portfolio Performance Record of Individual Investors," Journal of Finance (May 1978).

TABLE 1: Individual Investor Performance

Mean Annualized Rates of Return[1] (Percents)

Investor Performance Quintile	Actual Returns		Risk-Adjusted Returns	
	Before Transactions Costs	After Transactions Costs	Before Transactions Costs	After Transactions Costs
1	- 2.4	- 5.0	- 9.5	-12.2
2	5.9	4.3	- 1.9	- 3.4
3	9.5	8.1	1.0	- 0.3
4	13.9	12.1	4.8	3.2
5	29.9	26.3	18.3	14.9

[1] Annual rates defined as $(1 + r_j)^{12} - 1$, where r_j is the arithmetic average for individual j of his or her portfolio's monthly rates of return over the eighty-four-month study period. The quintile means listed are unweighted averages of the r_j of the investors in the quintile.

of those four performance measures and grouped into quintiles according to each. The resulting array of portfolio mean rates of return is presented in table 1.

As is evident, there is considerable dispersion in the sample with regard to realized investment performance. The least successful one-fifth of the investors studied experienced a negative 2.4 percent average annual pre-transactions-cost return on their stock portfolios, while the top one-fifth enjoyed nearly a 30 percent positive annual rate. Moreover, a one-way analysis of variance indicates that the mean rate of return for each of the quintiles is significantly different from those of the other four, at the 99 percent confidence level. This is true of the groupings for all four return measures.

Several aspects of the return profiles are worth emphasizing. For one thing, all four distributions are "fat tailed": the mean returns of the three middle quintiles are fairly tightly clustered, but there is a much larger gap between them and the top and bottom performance groups. Additionally, the risk adjusted return figures are well below their raw return counterparts across the board —a reflection of the fact that the portfolios involved contained securities having average betas noticeably greater than 1.00 in a period of generally rising stock prices. Finally, the posttransaction-cost return distribution adjusted for risk, which is logically the "bottom line" in appraising investor success or failure, is approximately symmetrical and centered on zero. A significance test indicated that the individuals in question experienced returns that in the aggregate could not be distinguished statistically from the concurrent returns on naively selected stock portfolios of similar risk. Collectively, they matched the market. A supplemental comparison with the performance of a large sample of mutual funds during the same period revealed that these individuals' portfolios also did as well as similar professionally managed equities portfolios.

Cross-Sectional Performance Differences

Because distinctively different investor performance subgroups did appear to be present, we attempted to identify the investment strategy and personal circum-stance correlates of superior and inferior return results. A coding scheme that linked (anonymously) the questionnaires returned by the sample to the particular account involved allowed us to establish this connection.

The independent variables employed fall into three categories and are listed in table 2. One encompasses a set of key dimensions of portfolio design derived directly from the data in the account transactions file. These include such items as the systematic risk level of portfolio, its percentage allocation among securities traded in the three major market locales, its dollar size and annual turnover rate, the proportion of margined and short positions it contained, the extent of the burden of transactions cost paid, the number of different securities in which positions were held, an index of the degree of diversification in the portfolio, and a measure of the investor's apparent reliance on the advice of the account executive with whom he or she dealt.

The portfolio betas were computed as the position-dollar-weighted average of the betas of the constituent securities. The individual security betas involved were

TABLE 2: Independent Variables for the Cross-Sectional Analysis

A. Elements of Portfolio Design:

Portfolio beta
Percentage investment in:
  ASE-listed stocks
  OTC and regional-exchange stocks
Total portfolio market value
Annual portfolio turnover rate
Percentage of portfolio consisting of:
  Margined positions
  Short positions
Annual transactions costs as a percent of portfolio value
Number of different stocks held
Index of portfolio diversification
Percentage of solicited trades

B. Elements of Investor Strategy:

Rating of importance of the following portfolio objectives:
  Dividend income
  Short-term capital gains
  Long-term capital gains
Primary approach to security selection:
  Fundamental analysis
  Technical analysis
  Rely on brokerage firm and account executive
Time spent per month managing portfolio
Dollars spent per year on information sources
Own mutual fund shares
Perceived percent of portfolio in "income" securities

C. Investor Demographic Characteristics:

Age
Sex
Marital status
Education level
Family size
Annual pretax income

estimated by regressing their monthly returns on the concurrent monthly returns on a value-weighted market index over the seven-year interval of the study.[3] The portfolio turnover rate was defined as the minimum of the dollar value of purchases or sales within the month, divided by the average portfolio value for the month. The measure of reliance on an account executive is based on the percentage of the investor's total stock transactions in the 1964–70 period that were tagged in the file as having been "solicited" by the account executive rather than initiated by the customer. The diversification index used is defined as the sum of the squared value weights of the securities comprising the portfolio.[4] The lower the resulting index, the *greater* the degree of diversification.

Various elements of the investor's proclaimed portfolio strategies and objectives make up the second category of independent variables considered. They arise from the responses returned on the questionnaire survey. Each individual was asked to rate dividend income, short-term capital gains, and long-term capital appreciation as investment goals. The rating scale was one through four, where four denoted a very important objective. Additionally, the respondent was requested to indicate his or her primary approach to security analysis and selection, the amount of time (per month) and money (per year) spent on managing the portfolio and acquiring investment information, whether he or she also owned shares in mutual funds, and the proportion of the portfolio that was regarded as comprised of securities selected specifically to produce current cash income.

The third set of variables—also from the questionnaires—consists of six standard demographic attributes of the investor-respondent. They were included in order to attempt to identify any links between investment styles and personal circumstances. As it happens, several such phenomena can be found.

Table 3 contains the results of a multiple discriminant analysis of the differences among the five investor performance groupings, for the measure of risk-adjusted posttransactions-cost return. Each of the independent variables in table 2 was included in the analysis, but only those for which a univariate F test indicated across-quintile statistical significance at the 95 or 99 percent confidence level are recorded.

Clearly, there *are* a number of dimensions of investment behavior and style for which differences can be discerned among the investor performance groupings. Perhaps the most noteworthy aspect of the data, however, is the fact that the across-group profile for almost every independent variable is either U-shaped or an inversion thereof—i.e., those investors who perform best and those who perform worst generally share common characteristics that distinguish them from the remainder of the sample.

[3] As described in G. Schlarbaum, W. G. Lewellen, and R. Lease, "Realized Returns on Common Stock Investments: The Experience of Individual Investors," Journal of Business *(April 1978).*

[4] M. Blume, J. Crockett, and I. Friend, "Stock Ownership in the United States: Characteristics and Trends," Survey of Current Business *(November 1974).*

TABLE 3: Discriminant Analysis of Individual Investor Portfolio Performance Groupings: Risk Adjusted Posttransactions-Cost Rates of Return

	Variable Mean, for Investor Performance Quintile					Uni-variate F
	1	2	3	4	5	
Annual Rate of Return (%)	-12.2	-3.4	-0.3	3.2	14.9	
Independent Variables						
A. Elements of Portfolio Design:[1]						
Index of diversification	.51	.40	.31	.36	.51	24.86
Annual portfolio turnover rate	61%	28%	24%	25%	29%	4.75
Portfolio size (×10³)	$15	$36	$52	$53	$28	6.98
ASE portfolio percentage	15%	9%	8%	12%	17%	8.91
Portfolio beta	1.26	1.17	1.17	1.21	1.33	9.21
Annual transactions costs	4.8%	1.2%	1.1%	2.2%	3.7%	6.06
Number of different stocks	4.5	7.4	8.8	10.3	5.4	5.17
B. Elements of Investment Strategy:						
Importance of short-term gains[2]	2.00	1.91	1.63	1.66	2.02	6.84
Income securities proportion	37%	44%	49%	41%	36%	6.62
Importance of dividends[2]	2.54	2.70	2.79	2.72	2.52	2.37[3]
C. Investor Characteristics:						
Age (years)	55	59	59	59	56	5.06
Family size	3.1	2.6	2.6	2.6	3.1	4.71
Proportion male	89%	82%	76%	75%	80%	3.67

[1] Listed in order of stepwise entry.
[2] Rating on scale of one to four.
[3] Significant at 95-percent level; others significant at 99-percent level. Critical F values are, respectively, 2.37 and 3.32.

Specifically, their portfolios are much more concentrated in just a few securities, whether judged simply by the number of different stocks in which positions are held or by the diversification index computed. Those portfolios are relatively small (which might be expected if they contain only a few securities) and they are differentially heavy in high-beta stocks listed on the American Exchange. Both sets of investors report themselves to emphasize short-term capital gains *more,* and dividend income *less,* as investment objectives than do their peers. This attitude shows up further in a relatively low proportion of income securities in their portfolios, at least as they perceive the composition. The major difference between the two sets of investors lies in the intensity of their trading activity. The annual portfolio turnover rate of the investor quintile with the poorest performance is noticeably above that of the remainder of the sample.

The message one gets, then, is the following: there seem to be, in the sample studied, two fairly distinct in-

vestment styles. On the one hand, there is a set of individuals who hold relatively well diversified portfolios comprised of stocks that tend to have a low systematic risk, chosen with a reasonable eye toward those securities' dividend-paying attributes. These investors de-emphasize short-term capital gains as a portfolio goal, revise their portfolios at a moderate pace, and experience "middling" investment performance results during the period covered by our data. On the other hand, there is a group of individuals who focused their attention on a relatively small number of high-risk, low-yield stocks designed to generate returns in the form of capital gains. Within *that* group, however, especially heavy trading exacted a discernible toll: the more active traders are overrepresented in the bottom performance quintile. Thus, the most extreme residual-return results for the sample as a whole were recorded, at the upper end, by individuals who dealt in high-beta stocks at a modest turnover level and, at the lower end, by investors who engaged in what could be described as rather frenzied trading activity in the same types of securities.

Some distinctions along demographic lines across the performance categories can be detected as well, and again the relationships are U-shaped. In particular, the investor groups in the three middle performance quintiles are older than those at the extremes. Not surprisingly, therefore, they typically have smaller families and, given more favorable mortality rates for females, contain a slightly lower proportion of male investors. We have found evidence of such a "life cycle" profile of portfolio management styles elsewhere.[5] In general, the older the investor, the more conservative is his or her investment posture and the greater is the emphasis on dividend income in selecting securities.

The independent variables that did *not* show up in the analysis are themselves of some interest. There were, for example, no statistically significant differences among the investment performance groupings with regard to the reported amount of time and money spent on security analysis and information collection. Nor did an especially strong reliance on the advice of the individual's account executive and a concomitant high percentage of solicited stock transactions appear to distinguish successful from unsuccessful investors. The absence of such effects would presumably be consistent with notions of market efficiency. Finally, there was no indication of a relationship between investment performance and either the income bracket or educational level of the investor.

Continuing Research Efforts

At present, we are in the process of updating our study by assembling transactions information both on the original sample and on a new one, for the period 1971 through 1978. This will enable us to extend the investigation to a substantially different set of stock market conditions and will make additional longitudinal analyses of individuals' investment strategies possible. Related

topics include the cost of trading—i.e., securities transaction execution prices—for individuals in comparison with institutions, the use of brokerage house research recommendations as information sources for individuals, and the presence (or lack thereof) of tax induced tendencies for investors to specialize their stock holdings in securities with distinctive dividend-yield or risk attributes.

Research on Unemployment and Labor Markets

Robert E. Hall

Some of the most serious problems of the U.S. economy—most notably recession and inflation—can be traced to certain important features of the labor market. The labor market is very different from the wheat market or stock market, exchanges in which large volumes of homogeneous products change hands at common prices. In the labor market, individual workers or small groups of workers have unique employment arrangements with single employers. The terms of these employment arrangements have important implications for the operation of the economy. The research reported here examines the microeconomics of the relations between workers and employers in an effort to understand the macroeconomic puzzles of persistent high unemployment and continuing inflation.

How Employment Responds to Fluctuations in Demand

In markets for skilled, experienced workers, there is often a mutual interest between worker and employer in a more or less permanent relationship. But employers experience occasional fluctuations in demand, either from the business cycle, or more frequently, from events specific to the market or the firm. A paper that I wrote with David Lilien[1] examines the characteristics of the employment arrangements that would prevail in this kind of market under certain reasonable assumptions. Foremost among the assumptions is that changes in the volume of employment respect the value of workers' time. To the extent that workers can make good use of time away from their permanent jobs, either in temporary alternative work or in activities apart from work in the market, a decline in demand will result in a decline in employment. On the other hand, when workers have strong preferences for full-time work, because they do not have useful alternative activities, their employment arrangements should bring about highly stable employment even in the face of fluctuating demand.

More specifically, we examine how a contract be-

[5] W. G. Lewellen, G. Schlarbaum, and R. Lease, "Patterns of Investment Strategy and Behavior Among Individual Investors," Journal of Business *(July 1977).*

[1] R. E. Hall and David Lilien, "Efficient Wage Bargains under Uncertain Supply and Demand." NBER Working Paper No. 306, December 1978, also forthcoming in American Economic Review *(March 1980).*

tween workers and employers could be written so as to bring about the most efficient employment response to a change in demand. We assume that only management can measure a shift in demand. Unless the contract is carefully drawn, management could, in principle, gain by misstating demand in its own interest and against labor's interest. We point out that a contract can be written to overcome this problem by making the interests of management and labor coincide. This requires that the compensation paid to labor reflect, on the margin, the value of workers' time. Under this kind of contract, management can be given the unilateral right to determine employment; they will do this efficiently in the face of shifts in demand because of the incentives in the contract. But we also show that such a contract cannot bring about an efficient response to a shift in the value of workers' time. Consequently, contracts must be renegotiated periodically to accommodate these shifts on the supply side. When negotiations occur, only supply issues are relevant—the existing contract will have taken care of demand shifts already. Two puzzles of employment arrangements as observed in the U.S. economy are solved by this analysis: the unilateral determination of employment by management and the apparent irrelevance of the state of demand in the negotiation of contract renewals.

Aggregate Fluctuations in Employment

A more recent paper[2] continues some of these themes in an examination of employment data in the postwar U.S. economy. This question is asked: Can the observed relation between the determinants of aggregate demand and total employment be understood in terms of the efficient use of workers' time, or must we attribute them to imperfections in employment arrangements? The answer is mixed. The way that exogenous bursts of demand affect real wages and real interest rates on the one hand and employment on the other is roughly consistent with microeconomic evidence about labor supply. In this respect, a theory that does not invoke imperfections is supported. But the evidence shows that the money stock influences employment in an important way, which seems to contradict the theory. In the absence of imperfections, the money stock ought to influence prices and wages but not employment. The strong association between money and employment is the single most convincing piece of evidence in favor of imperfections in employment arrangements. The revolution in macroeconomics brought about by John Maynard Keynes rests exactly on imperfections of this kind. However, we still lack a good economic explanation of just what the imperfections are and why they persist in a free market.

Labor Markets Where Workers Move among Jobs

In three recent papers, I study the operation of labor markets where it is efficient for workers to move from one job to another instead of remaining permanently with the same employer. Individual employers face fluctuations in their own demand that are independent of fluctuations facing other employers of the same type of workers. If mobility costs are not too high, it is efficient for workers to move out of firms with slack demand and into those with strong demand. The extent to which this happens depends on recruiting, hiring, and training costs for employers and also on workers' preferences about the time spent looking for new work. In "A Theory of the Natural Unemployment Rate and the Duration of Employment,"[3] these considerations are shown to determine the natural or long-run unemployment rate. Under plausible assumptions, the natural rate is unaffected by shifts in the demand for and supply of labor. But the analysis also points out the obstacles to rapid movement of the labor market toward the natural rate after a demand shock pushes unemployment above or below the natural rate. A market that relies on the sharing of a common labor force by a variety of firms may be vulnerable to a lasting disruption from a shift in demand.

In "The Minimum Wage and Job Turnover in Markets for Young Workers,"[4] the same set of ideas is applied to the case of a labor market distorted by minimum wage legislation. The usual analysis suggests that the minimum wage raises unemployment by making it more difficult for job seekers to find work. This paper points out an alternative: the minimum wage may raise unemployment by stimulating job turnover. In a market distorted by a minimum wage, jobs will be briefer, and workers will need to look for new jobs more often. Even though jobs are no harder to find than in a free market, unemployment will be higher. The paper presents evidence that young workers in the United States, who are the most strongly influenced by the minimum wage, have much higher unemployment than older workers do because their jobs are so much briefer, not because it takes them any longer to find work.

The third paper in this group, "The Role of Prevailing Prices and Wages in the Efficient Organization of Markets,"[5] undertakes an examination of why employers make use of unilateral quantity adjustments in response to changes in demand. It argues that one of the efficient ways to organize a market is for all employers to quote a common prevailing wage, and not to use wage adjustments to attract labor or to drive away redundant labor. In a market organized with a prevailing wage, workers can follow the simple strategy of accepting the first job that comes along. They need not concern themselves with the possibility that the next job offer might be better

[2] R. E. Hall, "Labor Supply and Aggregate Fluctuations," paper presented to the Carnegie-Rochester Conference, April 1979, forthcoming as NBER Working Paper.

[3] R. E. Hall, "A Theory of the Natural Unemployment Rate and the Duration of Employment," NBER Working Paper No. 251, July 1978, also in Journal of Monetary Economics (April 1979).

[4] R. E. Hall, "The Minimum Wage and Job Turnover in Markets for Young Workers," paper presented at the NBER Conference on Youth Joblessness and Employment, Airlie, Virginia, May 1979, forthcoming as NBER Working Paper.

[5] R. E. Hall, "The Role of Prevailing Prices and Wages in the Efficient Organization of Markets," mimeographed, January 1979, forthcoming as NBER Working Paper.

than the current one. In return, they grant to the employer the right to determine when workers need to be laid off to find jobs elsewhere. Prevailing wages simplify the problem of allocating workers among a set of employers who experience independent, unpredictable fluctuations in demand. But the use of a prevailing wage may make the market as a whole vulnerable to shocks that hit all employers together, as happens in a recession. Prevailing wage organization may be one of the reasons that the aggregate economy is vulnerable to monetary and other shocks.

The Nature and Measurement of Unemployment

Analysts of the contemporary problems of unemployment need to keep in close touch with the facts about who is unemployed and why. One of my studies[6] examines the raw data from the official government unemployment survey—the Current Population Survey—in order to give a comprehensive picture of modern unemployment. Two surprising conclusions emerge. First, an important fraction of the unemployed attribute their job search to an interest in temporary work. Close to one million unemployed workers in 1977 said that they were unemployed because they were seeking only temporary work, not full-time, permanent work. This finding underscores the importance of very brief jobs in the overall operation of the labor market in the United States. Second, the study finds that only a minority of the unemployed list looking for work as the major activity in the week covered by the survey. The majority of the unemployed are either homemakers, students, or retirees. This finding complements the conclusions reached by NBER researchers Kim Clark and Lawrence Summers that the distinction between unemployment and being out of the labor force is not at all sharp. The activities of the unemployed are often remarkably similar to those who are not counted in the labor force at all.

[6] R. E. Hall, "The Nature and Measurement of Unemployment," NBER Working Paper No. 252, July 1978.

Social Security and Private Saving

Martin Feldstein

The effect of social security benefits on private saving cannot be determined from theoretical considerations. The basic life cycle model of Harrod and Modigliani suggests a strong presumption in favor of the conclusion that an unfunded social security program depresses national saving. But the traditional life cycle model is too restrictive in its assumption of a fixed (or exogenously determined) retirement age. Social security may induce earlier retirement and this, in turn, may stimulate saving. The net effect of social security on saving thus depends on balancing the traditional "wealth replacement effect" and the "induced retirement effect." Other sources of theoretical indeterminacy are introduced by the pos-

sibility of irrational behavior by some individuals, by induced changes in private intergenerational transfers, by the role of unfunded private pensions, and by the special characteristics of social security benefits as a form of wealth. Only by an analysis of data on private saving and wealth can we hope to assess the actual effect of social security.

During the past several years, I have been studying different types of data to try to measure the impact of social security on private saving in this more general "extended life cycle model." This research report, which summarizes the results of those studies, is based on a longer paper that reviews the studies of this subject by others as well as my own work.[1]

The Time-Series Evidence

During the late 1930s and the succeeding war years, there was a general expectation among economists that the saving rate would continue to rise as people became more affluent and as retirement at age 65 became increasingly common. That increase in saving did not materialize. Even as incomes rose very substantially in the 1960s and the fraction of men over 65 who were still working dropped to less than half the rate in the 1920s, the aggregate saving rate did not increase significantly. This was also the period in which social security was introduced and in which it grew rapidly. In the 1940s, early American Keynesians like Seymour Harris (and even Keynes himself) predicted that the U.S. social security program could preclude the "excessive" growth of private saving. Time-series analysis of aggregate saving behavior permits a test of this view and, more generally, an estimate of the effect of changes in the level and scope of the social security program.

The basic problem in doing such time-series analysis is measuring the magnitude of the social security program in a way that corresponds most closely to its potential effect on private saving. Surveys confirm that individuals do not have precise estimates of the likely value of their future social security benefits. Although legislative changes create benefit entitlements immediately, these new benefits are recognized only slowly by the individuals affected. There is no completely satisfactory solution to this problem. In practice, all of the researchers have used "social security wealth," i.e., the present actuarial value of the future benefits to which the working population is entitled.[2] This overly precise measure cannot provide an accurate picture of year-to-year variations in the public's perception of the extent to which they can rely on social security, but hopefully, it does capture the broad sweep of changes including the original introduction, the major extensions of coverage, and the provision of dependents' benefits.

[1] M. Feldstein, "The Effect of Social Security on Saving," NBER Working Paper No. 334, April 1979. This was the 1979 Paish Lecture to the British Association of University Teachers of Economics and will be published by them.

[2] The idea of social security wealth is introduced and described in M. Feldstein, "Social Security Induced Retirement and Aggregate Capital Accumulation," Journal of Political Economy (1974).

When a social security wealth variable is added to a standard aggregate consumption function that is estimated with annual data for the period 1929 through 1974 (without the six war years), its coefficient is 0.024 (with a standard error of 0.009).[3] Adding this variable has relatively little effect on the coefficients of the other variables. Since the aggregate value of social security wealth in 1972 was $1.85 trillion,[4] a coefficient of 0.024 implies that social security increased consumption (and thereby depressed private saving) by $44.4 billion. In 1972, total private saving (including real corporate retained earnings) were $75.3 billion. A reduction in saving of $44.4 billion is thus equivalent to 59 percent of actual saving in 1972.

Data for the postwar period alone appear to be incapable of providing useful information on the effect of social security. In all of the studies using postwar data, the standard error of the coefficient of the social security wealth variable is so large that no economically interesting hypothesis can be rejected. This reflects not only the shorter period but also our inability to measure accurately enough the perceived changes in the public's expectation about future social security benefits. This inadequacy of the postwar data makes it important to examine other types of information, including cross-section data on individual households and cross-country studies of international differences in saving rates.

Individual Household Evidence

The best microeconomic data on the wealth of individual American households remains the Survey of Consumer Finances that was conducted in 1963 by the U.S. Census Bureau. On the basis of the information collected in the survey, I estimated the social security wealth of each household in the sample with a male between the ages of 35 and 64. In the first analysis of social security wealth in this data,[5] I compared the characteristics of the distribution of ordinary "fungible wealth" with the characteristics of the distribution of "total wealth" (defined as the sum of ordinary fungible wealth and social security wealth). The key conclusion of that comparison is that the distribution of total wealth is much less concentrated than the distribution of ordinary fungible wealth. For example, while the top 1 percent of wealth holders had 28.4 percent of fungible wealth in 1963, they had only 18.9 percent of total wealth. Since the concentration of ordinary wealth has shown no trend over the past fifty years, this evidence indicates a substantial reduction in the concentration of total wealth over this period.

This reduction in the concentration of total wealth is what would be expected because of the reduced concentration of disposable income over this century as well as the growing importance of estate taxes. This helps to resolve the apparent paradox of a stable concentration of wealth as conventionally measured and suggests that the concentration of fungible wealth has remained stable because of the growth of social security wealth.

Within each age group, the distribution of income among income classes is more similar to the distribution of total wealth than to the distribution of fungible wealth. The life cycle theory of wealth accumulation is thus more consistent with the distribution of total wealth than with the distribution of fungible wealth. This provides further indirect evidence that the prospect of social security benefits induces households to reduce their accumulation of private fungible wealth.

To test this relation between social security wealth and individual wealth accumulation more explicitly, Anthony Pellechio and I used these data to estimate the effect of each household's social security wealth on that household's preretirement accumulation of ordinary fungible wealth.[6] For this study, we limited our sample to households in which there was an employed man aged 55 to 64; households with very low or very high incomes were also eliminated. The basic parameter estimates indicated that social security substantially reduces the accumulation of household wealth as traditionally defined. More specifically, the point estimates generally indicate that each dollar of social security wealth reduces ordinary net worth by somewhat less than one dollar. The standard errors are too large to reject the implication of the traditional life cycle model that there is dollar-for-dollar replacement, but the estimates are also consistent with a rather wide range of other replacement rates. In general, however, the estimates are not compatible with the hypothesis that social security does not depress private wealth accumulation. This microeconomic evidence therefore supports the conclusion reached on the basis of the time-series evidence.

New data on household wealth and on social security are just becoming available at this time. These new data represent substantially larger samples and contain information on potential social security benefits based on administrative records. They will therefore provide important opportunities to refine the existing analysis of household behavior.

International Evidence

The final type of evidence that I have examined is the relation between international differences in social security and saving rates. In my analysis of this type of data, I have built on earlier work by Houthakker and Modigliani.

[3] This particular equation was presented in M. Feldstein, "The Effect of Social Security on Private Saving: The Time Series Evidence," Social Security Bulletin (1979) and NBER Working Paper No. 314, February 1979. It is the same specification as reported in M. Feldstein, "Social Security Induced Retirement and Aggregate Capital Accumulation" with a longer sample period and the new national income account revisions that were published in 1976.

[4] M. Feldstein and A. J. Pellechio, "Social Security Wealth: The Impact of Alternative Inflation Adjustments," in Colin Campbell, Social Security, 1979, also NBER Working Paper No. 212, November 1977.

[5] M. Feldstein, "Social Security and the Distribution of Wealth," Journal of the American Statistical Association (1976).

[6] M. Feldstein and A. J. Pellechio, "Social Security and Household Wealth Accumulation: New Microeconomic Evidence," in Review of Economics and Statistics, forthcoming, also NBER Working Paper No. 206, October 1977.

The basic life cycle model implies that a country's saving rate depends on the growth rate of aggregate income and the demographic structure of the population. To this I added an estimate of the ratio of social security benefits to average per capita income and a measure of retirement behavior.

The parameter estimates of this model imply that social security has a powerful effect on both saving and retirement. More specifically, if the retirement rate is held constant, an increase in the social security benefit ratio from one standard deviation below the sample average to one standard deviation above implies a reduction in the net private saving rate by 5.4 percentage points or 43 percent of the sample mean rate of saving. This overstates the *net* impact of social security on saving because an increase in social security benefits reduces the labor force participation of older men, which in turn increases the saving rate. In the reduced form of the model, with the retirement rate no longer held constant, the net effect of social security on saving is some 80 percent of this pure wealth replacement value; that is, an increase in benefits from one standard deviation below the average to one standard deviation above reduces the saving rate by 4.3 percentage points.

One of the most worrisome things about the data used in the study is the crude measure of the social security benefits that employees expect. The observed ratio of actual benefits per aged individual to average per capita income may reflect past practices and previous income levels. A new set of data, produced by the U.S. Social Security Administration in cooperation with officials of foreign governments, provides measures of the actual statutory ratio of benefits to the preretirement earnings of typical employees in twelve countries for the period 1969 through 1975. The coefficient estimates with these new data confirm the basic results obtained for the earlier period with the cruder measure of social security benefits.[7] It is quite reassuring that, despite the obvious problems of international comparability, the data appear to be rich enough to yield estimates of the impact of social security that are similar in magnitude to the estimates obtained with time-series data and with individual household observation.

Conclusion

The existing research indicates that social security does substantially depress the private saving rate. More generally, I believe that the studies of social security that I and others have been doing have also contributed to our understanding of the basic process of saving and capital formation, showing the explanatory power and appropriateness of the life cycle framework, as well as the need to extend the traditional life cycle model to a less restricted form of behavior.

[7] M. Feldstein, "International Differences in Social Security and Savings," NBER Working Paper No. 355, June 1979. This paper was presented at the NBER-SSRC Conference on Econometric Studies and Public Finance, June 13-16, 1979.

Economic Outlook Surveys

First Quarter 1979

According to a survey of professional economic forecasters, which was completed in February 1979, a small contraction is indicated in 1979: real GNP and its investment and durable goods consumption components, corporate profits, and industrial production are all expected to decline in the second half of the year. However, the decline should be short and mild so that, for the year as a whole, output will register a small gain of 2.6 percent. A general upturn in 1980:1 is predicted, but the unemployment rate will rise to 6.7 percent and stay at that level in both 1979:4 and 1980:1. Inflation will be reduced to the annual rate of about 7 percent in the same period, according to the average of the forecasts.

Inflation to Peak at Midyear

Forecasters see a high probability (about 36 chances in 100, on the average) that the GNP implicit price deflator will rise between 8 and 9 percent in 1979. Higher inflation rates are assigned nearly 30 chances in 100. The moderation of inflationary pressures will begin in 1979:3. Between 1979:1 and 1980:1, the same general price index is expected to increase 7.4 percent (which was the actual rate of inflation in 1977-78).

Divided Views About the Probability of a Recession

Of the thirty-four respondents to the February 1979 survey, twenty-one (62 percent) predict that real GNP will decline in 1979:3 and nineteen (56 percent) predict that it will decline in 1979:4. Thus sizable minorities foresee no recession in the near future, although most of them anticipate slower economic growth. Moreover, the probabilities attached to the declines in real GNP are relatively low (not much in excess of 50 percent for most of those forecasters who do predict a recession, as low as 10-20 percent for others). The mean probabilities for the group as a whole are 40 and 36 chances in 100 for 1979:3 and 1979:4, respectively. Although still less than 50, these estimates are the highest since the previous peak figures associated with the 1973-75 recession. Only one-third of the survey participants anticipate a decline in constant-dollar GNP in 1980:1.

Changes in Total Output, Industrial Production, and Unemployment

According to the median forecasts, real GNP (in 1972 dollars) will decline from $1,425 billion in 1979:2 to $1,418 billion in 1979:4, that is, by about 1 percent at an annual rate. The corresponding decline in industrial production (output of manufacturing, mining, and utilities) is 4 per-

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Projections of GNP and Other Economic Indicators, 1979-1980

	Annual			Percent Change			Quarterly 1979				1980	Percent Change	
	1977	1978	1979 Fore-cast	1977 to 1978 Ac-tual	1978 to 1979 Fore-cast	1978 Q4 Ac-tual	Q1	Q2	Q3	Q4	Q1	Q478 to Q479	Q179 to Q180
	Actual								Forecast				
1. Gross national product ($ bil.)	1887.2	2106.6	2335.0	11.6	10.8	2212.1	2269	2318	2358	2395	2442	8.3	7.6
2. GNP implicit price deflator (1972 = 100)	141.6	152.1	164.1	7.4	7.9	156.6	159.6	162.6	165.6	168.6	171.4	7.7	7.4
3. GNP in constant dollars (bil. 1972$)	1332.1	1385.1	1421.2	4.0	2.6	1413.0	1421	1425	1421	1418	1428	0.4	0.5
4. Unemployment rate (percent)	7.0	6.0	6.3	-1.0[1]	0.3[1]	5.8	5.9	6.1	6.4	6.7	6.7	0.9[1]	0.8[1]
5. Corporate profits after taxes ($ bil.)	102.1	118.3	125.3	15.9	5.9	124.7[2]	129.0	126.0	123.5	122.6	124.7	-1.7	-3.3
6. Plant and equipment expenditures ($ bil.)	135.8	153.1	169.8	12.7	10.9	161.2[3]	165.0	168.5	171.0	174.8	175.8	8.4	6.5
7. New private housing units started (ann. rate mil.)	1.99	2.02	1.73	1.5	-14.4	2.07	1.85	1.76	1.69	1.62	1.68	-21.7	-9.2
8. Change in bus. inventories GNP accts. ($bil.)	15.6	15.7	13.4	0.1[4]	-2.3[4]	11.6	15.3	16.4	14.0	7.7	9.7	-3.9[4]	-5.6[4]

Source: American Statistical Association and National Bureau of Economic Research, Business Outlook Survey, February 1979. The figures on each line are medians of 29 to 33 individual forecasts.

[1] Change in rate, in percentage points.
[2] Actual not available. Based on average forecast.
[3] Actual not available. Based on BEA survey of anticipations.
[4] Change in billions of dollars.

cent. The recovery in 1980:1 will carry total output to a new high level of $1,428 billion, but industrial production at 149 (1967 = 100) will still be two points below its peak of 1979:2. The unemployment rate is expected to rise gradually throughout this period, but three out of four forecasters expect it to remain below 7 percent of the labor force.

Business Investment and Profits

Business expenditures on plant and equipment will reach $170 billion in 1979, up 11 percent from 1978. This sector of the economy is relatively strong, but the median forecasts indicate that, after allowing for price rises, growth of business fixed investment will be near zero in the second half of the year. Corporate profits will decline 5.5 percent in current dollars and probably more than twice as much in real terms during the same period (at annual rates). Inventory investment will remain positive, decreasing from $16.4 billion in 1979:2 to $7.7 billion in 1979:4.

Consumer Capital Outlays

This sector is seen as considerably weaker than the business investment sector. Housing starts will fall to an annual rate of 1.6 million units in 1979:4, down 21.7 percent from the level of 2.1 million in 1978:4. A small increase to 1.7 million units in 1980:1 is expected. The sec-

ond half of 1979 will also witness a significant decline in consumer expenditures for durable goods, amounting at annual rates to 1.2 percent and 8.4 percent in current dollars and constant dollars, respectively. (The rough adjustments for inflation used here, as elsewhere in this report, are based on the median forecasts of the GNP price index.)

Assumptions

Most forecasters assume that monetary policy will be "mildly restrictive" into the second half of 1979. The few who comment on interest rates disagree on whether they will peak soon. Some expect a substantial budget deficit and an additional tax cut in 1980. The guidelines are viewed as ineffective but an imposition of mandatory price-wage controls is not assumed. Substantial increases in energy costs, but no acute crisis, are foreseen.

The national defense purchases are predicted on the average to rise 9.5 percent in the year ahead, to $114 billion in 1980:1.

Projections of GNP and Other Economic Indicators, 1979-1980

	Annual						Quarterly						
				Percent Change				1979		1980		Percent Change	
	1977 Actual	1978 Actual	1979 Fore-cast	1977 to 1978 Ac-tual	1978 to 1979 Fore-cast	1979 Q1 Ac-tual	Q2	Q3	Q4	Q1	Q2	Q179 to Q180	Q279 to Q280
									Forecast				
1. Gross national product ($ bil.)	1887.2	1958.1	2338.4	3.8	19.4	2265.6	2324	2364	2400	2454	2500	8.3	7.6
2. GNP implicit price deflator (1972 = 100)	141.6	152.1	165.0	7.4	8.5	159.8	163.4	166.7	170.0	173.2	176.3	8.4	7.9
3. GNP in constant dollars (bil. 1972$)	1332.7	1385.7	1417.4	4.0	2.3	1417.3	1422.7	1417.8	1411.8	1417.2	1418.0	0	-.3
4. Unemployment rate (percent)	7.0	6.0	6.1	-1.0[1]	+.1[1]	5.7	5.9	6.2	6.4	6.6	6.6	.9[1]	.7[1]
5. Corporate profits after taxes ($ bil.)	102.1	118.1	133.5	15.7	13.0	137.9[2]	136	132	128	130	135	-5.7	-.7
6. Plant and equipment expenditures ($ bil.)	135.8	153.8	170.3	13.3	10.7	164.2	169	172	176	178	180.5	8.4	6.8
7. New private housing units started (ann. rate mil.)	1.99	2.02	1.62	1.5	-19.5	1.62	1.70	1.60	1.58	1.62	1.75	0	2.9
8. Change in bus. inventories GNP accts. ($bil.)	15.6	16.0	16.6	+.4[3]	+.6[3]	18.1	19.0	16.3	13.0	10.0	12.5	-8.1[3]	-6.5[3]

Source: American Statistical Association and National Bureau of Economic Research, Business Outlook Survey, May 1979. The figures on each line are medians of 33 to 34 individual forecasts.
[1] Change in rate, in percentage points.
[2] Actual not available. Based on BEA survey of anticipations.
[3] Change in billions of dollars.

Second Quarter 1979

A mild decline in business activity limited to the second half of 1979 is the most likely outcome of the recent crosscurrents and uncertainties, according to a survey of professional economic forecasters which was completed in May. The recovery in the first half of 1980 is seen as rather slow, so that a year from now real GNP will be somewhat lower than in the current quarter. The inflation forecasts are higher than before, but the rate of the rise in the GNP implicit price index is still expected to crest in 1979:2. For the year 1979 as a whole, inflation so measured is set at 8.5 percent; between 1979:2 and 1980:2, at 7.9 percent.

The Outlook for Inflation

According to the median forecasts of quarterly changes at annual rate in the implicit price index, inflation rates will decline slowly in the year ahead, from 8.5 percent in 1979:2 to 7.5 percent in 1980:2. The probability that prices will rise between 7 and 9 percent in 1980 as compared with 1979 is assessed as very high—about 59 chances in 100. The probability of a still larger increase in the general price level is, however, also substantial (28 chances in 100, on the average). Thus many forecasters doubt that the expected slowdown will have a strong mitigating effect on inflation.

Uncertainty About Recession

One reason for the relative pessimism on inflation is that many forecasters are not at all convinced that a recession is imminent. Of 33 respondents, 21 expect real GNP to decline in 1979:3 and 19 expect it to decline in 1979:4; 20 anticipate declines in both quarters. Thus, nearly 40 percent of the survey participants do not foresee any recession this year, although slower economic growth is generally predicted. For the group as a whole, the mean probabilities attached to the declines in constant-dollar GNP are about 40 for 1979:3, 48 for 1979:4, 38 for 1980:1, and 28 for 1980:2. For the most part, these figures resemble the previous highest estimates associated with the 1973-75 recession, but they are still less than 50.

Forecasts of Changes in Production and Unemployment

The median prediction has GNP in 1972 dollars at $1,423 billion and $1,412 billion in 1979:2 and 1979:4, respectively, implying a decline of nearly 1.6 percent at an annual rate. In 1980:2, total output will be $1,418 billion, a rise of 0.9 percent at an annual rate. The prevailing view, then, is that the overall contraction will be

mild and short. Output of manufacturing, mining, and utilities, as measured by the industrial production index, is projected to level off in 1979:2, decline at annual rates of 1.3 percent and 5.4 percent in 1979:3 and 1979:4, respectively, stay unchanged in 1980:1, and rise 5.5 percent in 1980:2. At mid-1980, this index will be just a bit below its current level, should the average of the survey predictions turn out to be correct.

The unemployment rate is expected to rise in each quarter from 1979:1 through 1980:2, but very gradually. It is projected at 6.6 percent of the labor force in 1980:2, up from 5.9 percent estimated for 1979:2. In the year 1979 as a whole, unemployment should average 6.1 percent, not significantly higher than in 1978.

Corporate Profits and Investment

The low point in after tax profits is placed in 1979:4 at an annual rate of $128 billion, that is, about $10 billion less than the estimate for 1979:1. This would amount to a decline of less than 10 percent at an annual rate—much smaller than the declines recorded in the recent recessions. However, the figure translates into at least twice as large a decline in real operational profits as previously forecasted. In the first half of 1980, corporate profits after taxes are expected to recover to the level of $135 billion.

Business expenditures on plant and equipment will continue to increase in each quarter, from $169 billion in 1979:2 to $180.5 billion in 1980:2. This would be a rise of 6.8 percent, considerably less than the 10.7 percent increase projected for the year 1979 compared with 1978. After allowing for inflation in capital goods prices, these predictions imply that business fixed investment will show little or no real growth during the year ahead. (This is considerably more pessimistic than the forecast from the most recent survey of business investment plans.)

Inventory investment is seen as positive throughout, but decreasing to $10 billion annual rate in 1980:1, then picking up slightly in 1980:2.

Housing Starts and Consumer Durables

Consumer capital outlays constitute the weakest sector of the economy right now, according to most forecasters. However, housing starts will not fall much further this year: their trough of 1.58 million units at annual rate in 1979:4 will be followed by a recovery to 1.75 million in 1980:2. Consumer expenditures for durable goods are seen as virtually flat at $215 billion annual rate from 1979:2 through 1980:1, then rising to $220 billion in 1980:2. In constant dollars, of course, this would amount to a substantial decline.

Assumptions

No drastic changes in either monetary or fiscal policy are assumed. Some forecasters anticipate a "slightly tighter," others a "slightly more accommodating" Fed policy. Very few expect another tax cut. The views on energy are divided between the assumption of shortages

and higher prices and the assumption of increased supply. Most forecasters see a continuation of the wage-price guideposts but no imposition of mandatory controls.

NBER Profiles

Franklin A. Lindsay

Franklin A. Lindsay has been a member of the NBER Board of Directors since 1976, appointed by the Committee for Economic Development, and was recently elected to NBER's Executive Committee.

In 1961, after holding a number of high-level positions with the government and with international and public affairs organizations, Lindsay joined the Itek Corporation in Lexington, Massachusetts. Itek is a high technology manufacturer of optical systems, consumer and industrial products, and optical and electronic components. Lindsay was made president of Itek in 1962 and chairman of the board in 1975.

A member of the President's Advisory Committee on Trade Negotiations, Lindsay became a trustee of the CED in 1967 and was named chairman of its research and policy committee in 1974. A former trustee of Bennington College, he served on the visiting committee of Harvard's Center for International Affairs and is a current

member of the visiting committee of Harvard's economics department. Prior to his business career, Lindsay spent many years in public service assignments. He

served as executive assistant to Bernard Baruch on the United Nations Atomic Energy Commission, was a member of the U.S. delegation to the U.N. Disarmament Commission, and was the U.S. representative to the Executive Committee of the Organization for European Economic Cooperation. He has also been program officer for public affairs grants of the Ford Foundation.

A native of Ohio, Lindsay received an A.B. degree from Stanford University, where he was Phi Beta Kappa. He did graduate work at Stanford's Graduate School of Business and in the economics department at Harvard.

Lindsay and his wife have three children and reside in Lincoln, Massachusetts.

Wilbur G. Lewellen

Wilbur G. Lewellen, a member of NBER's Program in Financial Markets and Monetary Economics, has been associated with the Bureau since 1965. His research interests lie in business finance, taxation and public finance, portfolio management and investment analysis, and executive compensation.

Lewellen received a B.S. in aeronautical engineering from Pennsylvania State University in 1959. His M.S. (1961) and Ph.D. (1967) in management are from MIT.
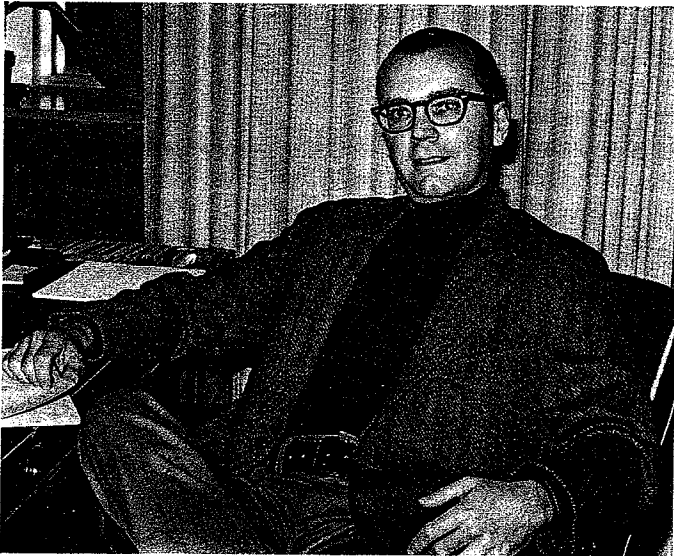
Since 1972, Lewellen has been professor of management at Krannert Graduate School of Management, Purdue University. While on the faculty of Krannert, Lewellen has been a visiting associate professor at MIT (1966–67) and Harvard (1969–70), and a visiting professor at MIT (1973–74). Also, since 1974 he has taught in the Executive Development Program of the University of Michigan's Graduate School of Business.

In 1973 and again in 1977, Lewellen received the Salgo-Noren Award as outstanding teacher in graduate professional programs at Purdue. In addition to writing numerous articles and books in the field of finance, Lewellen serves on the board of editors of *Financial Management,*

Journal of Business Finance and Accounting, Journal of Business Research, and the *National Tax Journal.* He served as vice president of the Financial Management Association in 1973–74, and has been a consultant to many corporations and government agencies including: TRW, Eli Lilly, Johnson and Johnson, Bank of America, the Board of Governors of the Federal Reserve System, and the U.S. Treasury.

Lewellen, who resides in West Lafayette, Indiana, is married and has four children.

David F. Bradford

David F. Bradford, director of NBER's Program in Business Taxation and Finance, joined the Bureau staff in 1977. He has taught at Princeton University since 1966 and is currently professor of economics and public affairs in Princeton's economics department and the Woodrow Wilson School.

In addition to his academic experience, Bradford has held several consulting positions in government service

and was Deputy Assistant Secretary for Tax Policy of the U.S. Treasury Department during 1975–76. He has also published many books and papers, particularly in the area of taxation.

Bradford received a B.A. in economics from Amherst College in 1960, an M.S. in applied mathematics from Harvard University in 1962, and a Ph.D. in economics from Stanford in 1966. He has worked and studied abroad at universities in Cambridge, Basel, Vienna, and most recently, at the Center for Operations Research and Econometrics in Louvain, Belgium.

Bradford and his wife Gundel live in Princeton, New Jersey, with their two children. They enjoy opera, skiing, and travel in their leisure time.

Conferences

Youth Unemployment

The Airlie House (Airlie, Virginia) was the setting, on May 17 and 18, for a Conference on Youth Joblessness and Employment, one major element of the NBER Youth Unemployment Project. The project, which began in December 1977, has been funded jointly by IBM, the Sloan Foundation, and the U.S. Department of Labor.

Two surveys of statistics on youth employment and unemployment—one by Martin Feldstein and David Ellwood, the other by Richard Freeman and James Medoff—form the background for the conference itself. Using new tabulations from the March 1978 Current Population Survey, Feldstein and Ellwood find that only 5 percent of teenage boys are unemployed, out of school, *and* looking for full-time, permanent work. However, there *is* a small group of relatively poorly educated teenagers for whom unemployment is a serious problem that does *not* significantly improve as they move into their twenties.

Among those seeking work, unemployment spells tend to be quite brief; over half of them end within one month. Feldstein and Ellwood also find that the overwhelming majority of the teenage unemployed are white, and that over one-half of the difference between black and white youth unemployment rates can be accounted for by demographic and economic differences, rather than race.

Freeman and Medoff find that the problem of high and increasing joblessness is intimately associated with movements into and out of the labor force. Since joblessness is critically interrelated to other social ills, such as crime and the changing family structure, Freeman and Medoff find it an area of great concern that merits further research.

The papers presented at the conference (by NBER researchers except where indicated), and their discussants, were as follows:[1]

Kim Clark and Lawrence Summers, "The Dynamics of Youth Unemployment" (NBER Working Paper No. 274)
Discussants: George Perry (Brookings Institution) and Robert Lerman (U.S. Department of Labor)

Richard Freeman, "Economic Determinants of Geographic and Individual Variations in the Labor Market Position of Young Persons"

Discussants: T. Aldrich Finegan (Vanderbilt University) and Sherwin Rosen (NBER and the University of Chicago)

Richard Freeman and James Medoff, "Why Does the Rate of Youth Labor Force Activity Differ Across Surveys?"
Discussants: Stephen Hills (Center for Human Resource Research, Ohio State University) and Paul Flaim (Bureau of Labor Statistics)

Charles Brown, "Dead-End Jobs and Youth Unemployment"
Discussants: Paul Osterman (Boston University) and Ronald Ehrenberg (Cornell University)

Robert Meyer and David Wise, "High School Preparation and Early Labor Market Experience" (NBER Working Paper No. 342)
Discussants: Frank Levy (The Urban Institute) and Gary Chamberlain (NBER and Harvard University)

David Ellwood, "Teenage Unemployment: Permanent Scar or Temporary Blemish?"
Discussants: Robert Willis (NBER and State University of New York at Stony Brook) and Burt Barnow (U.S. Department of Labor)

Albert Rees (Alfred P. Sloan Foundation) and Wayne Gray, "Family Background and Youth Unemployment"
Discussants: Christopher Winship (National Opinion Research Center, University of Chicago) and Ernst Stromsdorfer (ABT Associates)

Jacob Mincer and Linda Leighton, "Turnover and Unemployment"
Discussants: Alan Gustman (Dartmouth College) and Kip Viscusi (NBER and Northwestern University)

Robert Hall, "The Minimum Wage and Job Turnover in Markets for Young Workers"
Discussants: Christopher Sims (NBER and University of Minnesota) and Martin Baily (NBER and Yale University).

Richard Layard (London School of Economics), "Youth Unemployment in Britain and the U.S. Compared"
Discussants: Daniel Hamermesh (Michigan State University) and Beatrice Reubens (Conservation of Human Resources Institute, Columbia University).

Mary Corcoran (Institute for Social Research, University of Michigan), "Attitudes of Women and Changing Employment Patterns"
Discussants: Solomon Polachek (University of North Carolina) and Isabel Sawhill (National Commission for Manpower Policy).

Michael Wachter and Choongsoo Kim (University of Pennsylvania), "Time-Series Changes in Youth Joblessness"
Discussants: Edward Kalachek (Washington University) and Robert Gordon (NBER and Northwestern University).

Hall develops a model in which it is the duration of jobs, rather than wages, that equilibrates the youth labor market because of minimum wage imposed rigidities.

Layard compares unemployment in Britain and the United States and finds two major differences. There are fewer youth unemployed relative to adults in Britain than in the United States, and their spells of unemployment last twice as long on the average. Among the reasons for these differences are: higher income levels and lower labor force participation in the United States, less generous income maintenance programs for U.S. adults, and differences between U.S. and British minimum wage laws.

Corcoran finds that teenage joblessness has a significant effect on the future wages and employment of young women.

Wachter and Kim look at the impact of government programs on youth unemployment, evaluating the notion of changes in the equilibrium unemployment rate and the associated view that those changes are due to economic-demographic intermediate-run swings (as distinct from short-run business cycle swings).

At the Airlie Conference, labor economists from the United States, Canada, and Europe, who represented universities, private companies, foundations, and government, had the opportunity to discuss current research on youth unemployment. In addition to the authors and discussants, the participants included: Jerome Culp and Bernard Anderson, the Rockefeller Foundation; Randall Filer and Dawn Harris, Brandeis University; Donald Nichols, Jeanne Barnett, Harry Martin, and Melinda Green, U.S. Department of Labor; George Farkas and Joe Friedman, ABT Associates; B. Katherine Swartz, University of Maryland; P. Fortin, Universite Laval; F. Lazar, York University; Lawrence Brown, Justine Rodriguez, and Susan Nevas, HEW; Rick deLone and David Luery, Corporation for Public and Private Ventures; Robert Flanagan, Council of Economic Advisers; William Gainer, General Accounting Office; Terence Kelly, Task Force on Youth Development; F. Michon, Conseil National de la Recherche Scientifique (Paris); Robert Salais, Institut National de la Statistique et des Etudes Economiques (Paris); and David Mundel, Congressional Budget Office. It is expected that the conference proceedings will be published in a book in 1980; individual papers will soon be available as part of NBER's conference papers series.

National Accounts

National income and product accounts of the United States was the topic of NBER's Conference on Research in Income and Wealth, which met in Washington on May 3 and 4. The conference covered a wide variety of subjects ranging from the conceptual basis of the accounts, and their evolution since the early postwar period, to user experiences and data problems.

The first day was devoted to five papers dealing with conceptual issues and prices and deflation. The second day's agenda, which focused on users of the accounts, included a paper on the 1976 NIPA revisions and their effect on the BEA quarterly econometric model. One of the highlights of this session was a roundtable discussion by users of the accounts, including: Edward Denison, formerly with the Brookings Institution and now with the BEA; Alan Greenspan, Townsend-Greenspan; Lawrence Klein, University of Pennsylvania and Wharton Econometric Forecasting Associates; and Arthur Okun, Brookings Institution.

The following papers (given in the order of presentation) were discussed:

> Richard Ruggles (Yale University), "The United States National Income Accounts, 1944–77: Their Conceptual Basis and Evolution"
> Discussant: Helen Tice (Bureau of Economic Analysis)
> Franklin Fisher (MIT) and Karl Shell (University of Pennsylvania), "The Theory of Deflation"
> Discussant: W. E. Diewert (University of British Columbia)
> John Early and James Sinclair (Bureau of Labor Statistics), "The Treatment of Specification Change in the Measurement of Producer Price Changes"
> Discussant: Zvi Griliches (Harvard University and NBER)
> Richard Ziemer (Bureau of Economic Analysis), "The Deflation of Defense Purchases"
> Discussant: Marilyn Manser (Mathematica Policy Research)
> Robert Gordon (Northwestern University and NBER), "User Cost Changes and the Measurement of Durable Goods Prices"
> Discussant: Jack Triplett (Bureau of Labor Statistics)
> Bruce Grimm and Albert Hirsch (Bureau of Economic Analysis), "The Impact of the 1976 NIPA Benchmark Revisions on the Structure and Predictive Accuracy of the BEA Quarterly Econometric Model"
> Discussant: Saul Hymans (University of Michigan)

The Creamer Report (report of the Advisory Committee on Gross National Product Data Improvement) was the topic of the conference's final session. Morris Cohen, Long Island University, gave an overview and an evaluation of the report from a business cycle perspective. Long-term growth perspectives were presented by Ronald Kutscher, Bureau of Labor Statistics; John Gorman of the Bureau of Economic Analysis looked at data needs in flow of funds; and deflation was discussed by Albert Rees, Alfred P. Sloan Foundation and NBER. Responses to these presentations by Daniel Creamer of the Conference Board, Rosanne Cole of IBM, John Kendrick of George Washington University, and Stephen Taylor of the Federal Reserve Board concluded the conference.

Inflation Project Begins

The National Bureau of Economic Research has recently received funds to launch a two-year project on inflation, a major component of the Bureau's Program in Economic Fluctuations. The project, directed by Robert E. Hall, professor of economics at Stanford University, and director of the Bureau's Program in Economic Fluctuations, will bring together experts on macroeconomics, international economics, labor studies, individual industries, and the political economy of inflation. NBER participants in the project include: Martin Baily, Yale; Robert Barro, University of Rochester; Alan Blinder, Princeton; Dennis Carlton, University of Chicago; Rudiger Dornbusch, MIT; Martin Feldstein, Harvard; Stanley Fischer, MIT; Robert Gordon, Northwestern; Thomas Sargent, University of Minnesota; and John Shoven, Stanford. The work of the group will be overseen by a steering committee of four NBER research associates and an advisory group of experts from government, universities, and the private sector.

In order to facilitate an interchange of views between the researchers and representatives of government agencies or others interested in inflation, two one-day conferences will be held in Washington, D.C.

The inflation project is expected to cover the following ten major research areas, and to look at these and other questions:

1. Analysis of contemporary stagflation (coexistence of unemployment and inflation)—Why has inflation persisted both in periods of high demand and when the economy is generally slack?

2. Monetary policy, fluctuations, and inflation—What role do changes in the money supply play in the fight against inflation?

3. Domestic inflation and world markets—What is the relative importance of financial factors in determining the value of the dollar relative to other currencies?

4. The inflationary process in individual product markets —To what extent are prices in the market dependent on expectations rather than current economic forces?

5. The inflationary process in labor markets—How do union workers, and other workers who have long-term relationships with their employers that insulate them from fluctuations in the market, fare when compared to those workers who don't have these relationships and are competing in open labor markets?

6. A long-run view of inflation—How can understanding earlier periods of inflation help to clarify the current experience?

7. The public's view of inflation—What are the public attitudes toward inflation and the unemployment that may accompany efforts to curb inflation?

8. Governments' role in the inflationary process—How do minimum wages, payroll taxes, transportation regulations, environmental and safety controls, price support programs, and other government policies affect prices?

9. Inflation and economic uncertainty—What are the connections between inflation and uncertainties about the future?

10. Inflation, finance, and taxation—What effect does inflation have on the taxation of return to capital? How can investment be supported during periods of inflation?

Bureau Begins Tax Simulation Project

The National Bureau has recently received a two-year grant from the division of Applied Science and Research Applications of the National Science Foundation for simulation research on the effects of income and payroll taxes. The purpose of this project is to extend techniques of tax simulation analysis by incorporating estimates of the response of individual behavior to proposed changes in tax rules. The newly constructed tax simulation model will then be used to study such things as changes in the taxation of saving, adjustments for inflation, the likely effects of changes in the taxation of two-earner families, and changes in the social security system.

Allowance for individual responses to tax changes is necessary because simulation estimates based on the assumption that there is no response to a tax change can give very misleading impressions of the distributional, allocational, and revenue effects of tax changes. For example, a change in the tax treatment of the income of working wives would undoubtedly alter the amount of labor market services offered by wives. Similarly, several studies of the tax treatment of charitable giving indicate that the tax law has a substantial effect on giving and therefore on the amount of tax deductions taken.

Work on the Bureau's tax simulation model will involve several NBER researchers, each of whom will estimate some aspect of the individual behavioral response to tax changes. Harvey Rosen will contribute research on the effects of taxation on household behavior, especially on female labor force participation and on home ownership. Anthony Pellechio is a specialist in social security who will work on modeling response to changes in that program. Daniel Feenberg will be involved in efforts to determine the effects of adjustments for inflation. Joel Slemrod will continue the earlier work he and Martin Feldstein have done on the behavioral response of individuals to changes in capital gains taxation. Slemrod will also work on extending the model to incorporate the long-run feedback response of the economy. A project steering committee composed of Feldstein, Charles McLure, David Bradford, and John Shoven will provide general supervision and oversight of the project.

Conference Date Changed

NBER's Conference on the Taxation of Capital, organized by Peter Mieszkowski, has been rescheduled to November 16 and 17, 1979. The program that follows is tentative.

During the opening session on Friday morning, two papers will be presented: "General Equilibrium Impacts of Replacing the U.S. Income Tax with a Progressive Expenditure Tax" by Donald Fullerton, John B. Shoven, and John Whalley and "Tax Policy in a Life Cycle Model" by Lawrence H. Summers. Discussants will be Ann Friedlaender, J. Gregory Ballentine, David F. Bradford, and John Shoven.

On Friday afternoon, the following papers will be presented: "The Effects of Taxes and Demographic Changes on Savings" by Michael J. Boskin and Lawrence Lau; "The Effects of Personal Income and Social Security Taxes on Life Saving and Bequests" by Paul Menchik and Martin David; and "Public Employee Pensions and Aggregate Capital Accumulation" by Robert Inman and Laurence Seidman. Discussants will be Jerry Green, Peter Diamond, George Peterson, and Laurence Kotlikoff.

At Saturday morning's session, three papers will be discussed: "Inflation, Aggregate Demand, Capital Accumulation, and Productivity" by Liam Ebrill and Uri Possen; "Inflation, Taxes, and the Demand for Real Capital" by Martin Feldstein; and "Causes of the Decline in Aggregate Share Values: Profitability, Taxes, and Risk" by Patric Hendershott. Discussants are Burton Malkiel, Paul Taubman, William Vickrey, and Henry Aaron.

Anyone wishing to attend should contact Maureen Kay, NBER, 1050 Massachusetts Avenue, Cambridge, Mass. 02138.

Sloan Grant to Study Productivity, Compensation, and Employment

The Sloan Foundation of New York authorized a three-year grant this spring in partial support of NBER's research program on productivity, compensation, and employment. Richard B. Freeman, professor of economics at Harvard University and director of NBER's Program in Labor Studies, is the general director of the project. The overall goal of the research is to study institutional and structural changes in the U.S. labor market as they relate to productivity, wages, employment, and unemployment. To achieve this goal, recently computerized individual data will be meshed with information based on interviews and surveys of relevant decision makers.

Among the questions to be addressed in the project are: What impact have new laws such as those establishing OSHA and ERISA had on productivity and employment? What determines the wage rates or salaries attached to various positions? What effect does the increasing number of younger and older workers have on wages, employment, and productivity? Are the effects of economic fluctuations on labor supply and skills permanent or transitory? What role do industrial relations practices play in productivity? What effect do wage and fringe changes in union firms have on nonunion wages and fringes? Why have other industrial nations experienced slower wage inflation and more rapid productivity growth than the United States in recent years? And, what is the effect of deferred compensation, in the form of pensions and other fringe benefits, on the age-earnings profile?

March Meeting on Taxes

Members of NBER's Program in Business Taxation and Finance met on Monday and Tuesday, March 19 and 20, at the Bureau's Cambridge office. Program Director David Bradford of Princeton chaired the two-day meeting. The Monday session continued an analysis begun at the 1978 NBER Summer Institute on the determinants of corporate dividend behavior and share repurchases. Three attorneys from the Harvard Law School, William Andrews, Bernard Wolfman, and Victor Brudney, led a discussion of IRS and SEC regulations regarding stock dividends and repurchase of shares.

Bureau participants in the conference included: Alan Auerbach, Daniel Feenberg, Martin Feldstein, Benjamin Friedman, Daniel Frisch, Roger H. Gordon, Jerry Green, David Hartman, Laurence Kotlikoff, Charles McLure, Stephanie Seligman, John Shoven, Joel Slemrod, and Lawrence Summers.

Before adjourning on Monday, the group discussed possible topics for future research on pensions. Richard Freeman, director of the Bureau's Program in Labor Studies, suggested a study on the importance of pensions in total compensation packages. Among the topics suggested by Benjamin Friedman, director of the financial markets group, was the effect the increasing number of pension funds has on the interest rate structure of financial markets.

At Tuesday's meeting, Martin Feldstein and Stephanie Seligman described their work on the effect of unfunded pension liabilities on the value of corporate equities. Their preliminary results indicate that each dollar of unfunded pension liability reduces the value of corporate equity by approximately one dollar.

John Ciccolo, of Boston College, followed with a presentation of his preliminary findings on the effects of inflation and tax rules on the market valuation of corporate capital. His calculations indicate that the share value per dollar of real plant and equipment has been substantially reduced by the use of historic cost depreciation in our inflationary economy.

Similarly, Lawrence Summers presented calculations showing that, contrary to popular opinion, the total market value of corporate capital appears to be in line with aftertax corporate capital income.

Last on the program was Daniel Feenberg, who is working on the tax simulation project. Feenberg is concerned with how changes in the personal income tax would affect household decisions and, in particular, the labor supply.

International Studies

NBER's international studies group met at the Bureau's Cambridge office on March 16 for a full-day discussion of research on exchange rates. Professor William Branson of the Woodrow Wilson School, Princeton University, director of NBER's Program in International Studies, chaired the session. The following papers were presented:

> Richard Levich (New York University), "Analyzing the Accuracy of Foreign Exchange Advisory Services: Theory and Evidence"
>
> Charles Freedman (Bank of Canada), "An Econometric Model of the Canadian Exchange Rate"
>
> Paul Krugman (Yale University), "Vehicle Currencies and the Structure of International Exchange"
>
> Willem H. Buiter (Woodrow Wilson School, Princeton University), "Feedback and the Use of Current Information—An Application of General Linear Policy Rules to Exchange Rate Management and Foreign Exchange Market Intervention"

Richard Levich analyzes the ability of forecasting services to predict exchange rate movements, finding that, on average, advisory services are not as good in terms of average errors of prediction in predicting future rates as are the market's forward rates. However, in predicting on which side of the forward rate the realized future rate will be, some judgmental forecasters are correct more than half of the time. Judgmental forecasters are more accurate in the short run, and econometric forecasters are better in the long run.

Charles Freedman, deputy chief, Department of Monetary and Financial Analysis, Bank of Canada, presents an econometric study that explains fluctuations in the Canadian exchange rate during the 1970s. Given that Canadian prices rose more rapidly than American prices from 1971–76, it is surprising that the Canadian dollar did not depreciate during that period. Several other factors seem to have supported the Canadian exchange rate: terms of trade, long-term Canadian borrowing abroad, cyclical movements, and interest rate differentials between the United States and Canada.

Krugman analyzes how a given currency emerges as a vehicle currency (one that is widely used in international transactions) and what forces affect the vehicle currency status. He studies the role of transaction costs (the costs of exchanging one currency for another) in international exchange, and concludes that the currencies of economically dominant countries are most often vehicle currencies.

Buiter's work analyzes relationships between investors' knowledge and expectations and the structure and movement of exchange rates. Within this framework, he discusses the possibility of using government policies to stabilize an open economy even when individuals' expectations are fully rational and informed.

In addition to the authors, participants at the conference included: John Bilson, Rudiger Dornbusch, Martin Feldstein, Jacob Frenkel, Richard Marston, and Jeffrey Sachs of the Bureau; Jacques Artus, IMF; Pentti Kouri, Yale University; Nancy Marion, Dartmouth College; Guy Stevens and Dale Henderson, Board of Governors of the Federal Reserve System; and Alexander Swoboda, Graduate Institute of International Studies, Geneva.

Labor Group Discusses Compensation and Youth

On March 2, economists who are participating in the Bureau's Program in Labor Economics convened in the Cambridge office for a day-long meeting chaired by Program Director Richard Freeman. The papers that were presented fell into two general topic areas: alternating modes of compensating workers and youth unemployment.

"The Relationship Between Unemployment, Time Not Employed, and Turnover," by Jacob Mincer and Linda Leighton, looks at the questions: Why is youth unemployment so high? Is it too high? Why does youth unemployment decline with age in a particular fashion?

In "Family Effects in Teenage Employment," Al Rees and Wayne Gray find that the presence of employed siblings, but not parental characteristics, increases the probability of a youth's employment.

"Self-Selection, Learning-Induced Quits and the Optimal Wage Structure" is by Kip Viscusi. Given the assumption that the wage structure can be used to encourage worker experimentation with uncertain jobs, Viscusi finds that temporal wage structures can serve as a self-selection device to attract stable employees, and that these structures are the least costly mechanism for eliminating worker turnover.

"Piece Rate vs. Time Rate: Theory and Evidence," by Eric Seiler, is a study of the footwear and men's clothing industries. Seiler finds that incentive wage contracts yield higher average but more widely dispersed earnings for identical workers than do time contracts. Therefore, incentive paid workers face a riskier compensation stream, and exert greater effort in the production process.

In "Structure of Prizes in a Tournament," Sherwin Rosen and Edward Lazear look at compensation schemes that resemble prizes—that is, schemes under which workers are paid by rank rather than output. They find that the standard efficiency arguments of economics hold true even when wages take that form. Further, in risky activities, a prize structure of wages is preferable to a piece rate structure.

In addition to the authors, the meeting was attended by NBER Research Associates Gary Chamberlain, Kim Clark, Martin Feldstein, Zvi Griliches, James Medoff, Anthony Pellechio, Harvey Rosen, Robert Willis, David Wise, and Richard Zeckhauser and a number of other Bureau staff members.

1979-80 Research Associates

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David A. Wise
Victor Zarnowitz
Richard J. Zeckhauser

Walworth Named Director

Charles A. Walworth, a partner in the New York office of Deloitte Haskins & Sells, was recently elected to the board of directors of the National Bureau of Economic Research.

Mr. Walworth was born in Charleston, West Virginia, in 1931. He received a B.A. from Cornell University in 1953, and an M.B.A. from Harvard School of Business Administration in 1957. He joined the San Francisco office of Deloitte Haskins & Sells, an international public accounting firm, in that year, was made a partner in 1969, and was transferred to the executive office in New York in 1974.

Mr. Walworth, who is a member of the American Institute of Certified Public Accountants, has taught auditing at the University of San Francisco and Pace University in New York City. He has also been active in Cornell University alumni affairs and is a member of the Harvard Club of New York City. He and his wife Patricia have five children and reside in Riverside, Connecticut.

Moore and Abramovitz Honored

Geoffrey H. Moore and Moses Abramovitz, former directors of NBER's Program in Business Cycle Research, were named Emeritus Research Associates by the NBER directors at their April board meeting.

Moore joined NBER's research staff in 1939, after receiving the B.S. and M.S. degrees in agriculture from Rutgers University. He received a Ph.D. in economics from Harvard in 1947 and was made associate director of Bureau research in 1948.

In 1965, Moore was elected to the Bureau's board of directors and named director of research. He became vice president of research in 1968, and director of business cycle research in 1975.

Moore has been Commissioner of Labor Statistics for the U.S. Department of Labor from 1969-73, Senior Research Fellow at Hoover Institution, Stanford University, and a member of the New York State Council of Economic Advisers. He served as president of the American Statistical Association in 1968, and has taught at Rutgers, Columbia, and New York universities. A noted authority on business cycles, Moore has published numerous articles and books on the subject. He will continue his business cycle work as director of the recently established Center for International Business Cycle Research, Newark Campus, Rutgers University.

Abramovitz, Coe Professor of American Economic History at Stanford University and a distinguished scholar well known for his work on economic cycles and growth, has been associated with NBER since 1938. He received his A.B. from Harvard in 1932 and Ph.D. from Columbia in 1939.

After serving on the Bureau's research staff for nine years, Abramovitz was named director of business cycle studies in 1946 and held that position until 1948. At that time, he became professor of economics at Stanford University. In addition to serving on NBER's board of directors since 1968, Abramovitz was recently elected president of the American Economic Association.

NBER Book

Prompted by a concern over the stagflation that pervaded Latin America in 1974 and 1975, the National Bureau of Economic Research, along with the Panamanian Ministry of Planning and Economic Policy and the Latin American Institute for Economic and Social Planning, sponsored a conference titled Planning and Short-Term Macroeconomic Policy in Latin America. A volume of representative papers from that conference, *Short-Term Macroeconomic Policy in Latin America*, edited by Jere Behrman and James Hanson, is now available.

The conference had three broad objectives: (1) to evaluate the usefulness of forecasting techniques to Latin American planners, (2) to examine short-run constraints on policy making in these economies, and (3) to analyze fiscal and monetary policy options for Latin American countries. Generally, the papers presented in the NBER volume indicate that forecasting can be useful to Latin American planners. They also highlight the importance of exports to growth and the sensitivity of those exports to prices and exchange rate changes. Finally, the conferees find little support for the effectiveness of monetary policy in the countries under study, but find fiscal policy somewhat more effective in terms of raising output.

The Behrman-Hanson volume, priced at $20.00, may be ordered from Ballinger Publishing Company, 17 Dunster Street, Cambridge, Mass. 02138.

Reprints Available

The first in a new series of NBER reprints, intended for educational and research purposes, are now available:

1. *Wesley Mitchell in Retrospect*, Geoffrey H. Moore, 1978.
2. *Inflation and the Excess Taxation of Capital Gains on Corporate Stock*, Martin Feldstein and Joel Slemrod, 1978.
3. *Crowding Out or Crowding In? Economic Consequences of Financing Government Deficits*, Benjamin M. Friedman, 1978.
4. *Purchasing Power Parity: Doctrinal Perspective and Evidence from the 1920s*, Jacob A. Frenkel, 1978.
5. *A Status Report on Tax Integration in the United States*, Charles E. McLure, Jr., 1978.
6. *Inflation, Tax Rules, and the Long-Term Interest Rate*, Martin Feldstein and Lawrence Summers, 1978.
7. *Substitution and Division of Labour*, Sherwin Rosen, 1978.
8. *International Reserves: Pegged Exchange Rates and Managed Float*, Jacob A. Frenkel, 1978.
9. *The Current State of the International Business Cycle: A New Measurement System*, Geoffrey H. Moore, 1978.
10. *An Analysis of Annual and Multiperiod Quarterly Forecasts of Aggregate Income, Output, and the Price Level*, Victor Zarnowitz, 1979.
11. *Variation across Households in the Rate of Inflation*, Robert T. Michael, 1979.
12. *The Creation of Microdata Sets for Enterprises and Establishments*, Robert E. Lipsey, 1978.
13. *The Demand for Pediatric Care: An Hedonic Approach*, Fred Goldman and Michael Grossman, 1978.
14. *Determinants of Pediatric Care Utilization*, Ann D. Colle and Michael Grossman, 1978.
15. *Stochastic Implications of the Life Cycle-Permanent Income Hypothesis: Theory and Evidence*, Robert E. Hall, 1978.

These reprints are free of charge to corporate associates and other sponsors of the National Bureau. For all others, there is a $1.00 charge per reprint to defray the costs of production, postage and handling. Advance payment is required on orders totalling less than $10.00. Reprints must be requested by number, in writing, to: Reprint Series, National Bureau of Economic Research, Inc., 1050 Massachusetts Avenue, Cambridge, Mass. 02138.

Conference Papers Available

The first in a series of NBER Conference Papers, those from the October 13–14, 1978, Bald Peak Conference on Rational Expectations and Economic Policy, organized by Professor Stanley Fischer, is now available. Formal discussion of each paper is included with the paper itself.

Individual copies are available free of charge to corporate associates and other supporters of the National Bureau. Others can receive copies of the conference papers by sending $1.50 per copy to: Conference Papers, National Bureau of Economic Research, Inc., 1050 Massachusetts Avenue, Cambridge, Mass. 02138. Please use the following numbers when ordering papers:

1. "Rational Expectations, Business Cycles, and Government Behavior," by Herschel I. Grossman
2. "Unanticipated Money and Economic Activity," by Robert Barro and Mark Rush (with comments by Alan Blinder, Robert Gordon, and Robert Weintraub, and general discussion)
3. "The Monetary Mechanism in the Light of Rational Expectations," by Olivier Jean Blanchard (with comments by Bennett T. McCallum, Michael Parkin, and David E. Lindsey, and general discussion)
4. "Can the Fed Control Real Interest Rates?" by Robert J. Shiller (with comments by Phillip Cagan, Charles R. Nelson, James L. Pierce, and Martin Feldstein, and general discussion)
5. "A Competitive Theory of Fluctuations and the Feasibility and Desirability of Stabilization Policy," by Finn Kydland and Edward C. Prescott (with comments by Martin Feldstein, Robert E. Hall, and John B. Taylor, and general discussion)
6. "Rules, Discretion, and the Role of the Economic Advisor," by Robert E. Lucas (with comments by Robert E. Hall, Mark H. Willes, and Peter Howitt, and general discussion)
7. "On Activist Monetary Policy with Rational Expectations," by Stanley Fischer (with comments by Robert E. Hall, Mark H. Willes, and Peter Howitt, and general discussion)
8. "What to Do When OPEC Comes," by Robert M. Solow (with comments by Neil Wallace and general discussion)
9. "Macroeconomic Policy 1971–1975: An Appraisal," by William Poole (with comments by James L. Pierce and general discussion)

Seasonal Adjustment

The proceedings of a conference on seasonal adjustments, cosponsored by the National Bureau of Economic Research and the U.S. Bureau of the Census, are now available. *Seasonal Analysis of Economic Time Series,* Arnold Zellner, editor, includes the papers and discussion presented at the Conference on the Seasonal Analysis of Economic Time Series held in Washington, D.C., in September 1976.

The objectives of the conference were essentially twofold: (1) to provide a greater understanding of current and new methods of seasonal analysis and adjustment and (2) to identify methods by which the adjustment process might be improved.

The conference volume is divided into nine sections:

1. Objectives and Framework of Seasonal Analysis
2. Description and Analysis of Seasonal Adjustment Procedures in Use
3. Seasonal Adjustment of Sensitive Indicators, by Julius Shiskin (the keynote address)
4. Improvements and Special Problems in Procedures Currently in Use
5. New Methods for Analyzing Seasonal Problems
6. Econometric Modeling and Seasonality
7. Aggregation and Seasonal Analysis
8. General Discussion and Summary
9. Contributed Comments

To order the five-hundred-page report, send $6.75 per copy to: Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Current Working Papers

Individual copies of NBER Working Papers are available free of charge to corporate associates and other supporters of the National Bureau. Others can receive copies of the Working Papers by sending $1.00 per copy to Working Papers, NBER, 1050 Massachusetts Avenue, Cambridge, Mass. 02138. Please make checks payable to the National Bureau of Economic Research, Inc.

Abstracts of all Working Papers issued since February 1979 are presented below. For earlier Working Papers, see previous issues of the NBER **Reporter.** The Working Papers abstracted here have not been reviewed by the Board of Directors of NBER.

Nontrivial Equilibrium in an Economy with Stochastic Rationing

Seppo Honkapohja and **Takatoshi Ito**
Working Paper No. 322
February 1979

Stochastic rationing when the market does not clear draws attention because both Dreze (1975) and Benassy (1975) quantity-constrained equilibria have some undesirable features. Gale (1978) gave the existence proof of trade under uncertainty. His stochastic rationing depends on all the individual effective demands. It is too vague to characterize a rationing mechanism. Moreover, his assumption to ensure a nontrivial equilibrium is economically not clear.

In this paper we extend Green (1978) to characterizing the rationing scheme as the individual effective demand times the rationing number which is a function of the aggregate quantity signals. We also construct an economy with money and overlapping generations. We show the existence of the nontrivial equilibrium.

Comparing Public Library Services

Malcolm Getz
Working Paper No. 323
March 1979

The operations of thirty-one large public library systems across the country are compared using information from the author's interview survey. Operations are compared in physical terms: hours of service, materials, locations, and staffing. Differences in operations are found to be associated with differences in labor costs, local fiscal circumstances, and demographic factors. The libraries seem to reduce hours in the face of higher labor costs. Differences in the use of the libraries are found to be associated with differences in library services and demographic factors. The number of materials acquired per capita has a strong impact on library use.

Corporate Financial Policy, Taxes, and Uncertainty: An Integration

Alan J. Auerbach and **Mervyn A. King**
Working Paper No. 324
March 1979

In this paper we present a simple general equilibrium model of the portfolio behavior of households and institutions, paying particular attention to the influence of differences in tax rates and attitudes toward risk. Under the plausible assumptions that households are more averse to taking a risk than institutions and that households possess a greater relative "tax preference" for equity versus debt, we are able to characterize the equilibriums which may result when debt is subject to bankruptcy risk.

Among the issues which we study are the effects of tax rate changes, changes in risk, and changes in firm leverage on the relative asset holdings of the two types of investor and the rates of return earned on equity and debt. Numerical simulations provide additional understanding of the model's characteristics.

Analysis of Covariance with Qualitative Data

Gary Chamberlain
Working Paper No. 325
March 1979

In data with a group structure, incidental parameters are included to control for missing variables. Applications include longitudinal data and sibling data. In general, the joint maximum likelihood estimator of the structural parameters is not consistent as the number of groups increases, with a fixed number of observations per group. Instead, a conditional likelihood function is maximized, conditional on sufficient statistics for the incidental parameters. In the logit case, a standard conditional logit program can be used. Another solution is a random effects model, in which the distribution of the incidental parameters may depend upon the exogenous variables.

A Capital Market in an Equilibrium Business Cycle Model

Robert J. Barro
Working Paper No. 326
March 1979

Previous equilibrium business cycle models are extended by the incorporation of an economy-wide capital market. One aspect of this extension is that the relative price that appears in commodity supply and demand functions becomes an anticipated real rate of return on earning assets, rather than a ratio of actual to expected prices. From the standpoint of expectation formation, the key aspect of the extended model is that observation of the economy-wide nominal interest rate conveys current global information to individuals.

With respect to the effect of money supply shocks on output, the model yields results that are similar to those generated in simpler models. One new result concerns the behavior of the anticipated real rate of return on earning assets. Because this variable is the pertinent relative price for commodity supply and demand decisions, it turns out to be unambiguous that positive money surprises raise the anticipated real rate of return. In fact, this response provides the essential channel in this equilibrium model by which a money stock can raise the supply of commodities and thereby increase output. However, it is possible through a sort of liquidity effect for positive money surprises to depress the economy-wide nominal interest rate.

Sterling and the External Balance

Rudiger Dornbusch and **Stanley Fischer**
Working Paper No. 327
March 1979

This paper analyzes the behavior of the current account and the exchange rate in the British economy during the 1970s, and discusses the outlook, as influenced by the availability of oil revenues, for exchange rate developments during the 1980s.

Both trade and exchange rate behavior are affected by, and in turn affect, general macroeconomic developments and policy problems. In the short term, the major macroeconomic problems of the British economy are its high rates of inflation and unemployment. Over the long term, the underlying problem for the British economy is its slow productivity growth relative to the major OECD economies (except that of the United States).

There are two major themes in this paper. First, the accepted laws of economics continue to work in the United Kingdom; for example, low domestic demand and increased British competitiveness improve the balance of payments and slow the fall of the exchange rate. Second, Britain's achievement of macroeconomic goals depends upon the behavior of both nominal and real wages. The inflation rate will remain low only if the rate of change of nominal wages does; full employment with stable prices and current account balance will be achieved only if real wage growth is restrained or if productivity growth increases.

Public Libraries and Labor Markets

Malcolm Getz
Working Paper No. 328
March 1979

Differences in labor compensation among thirty-one large public library systems are examined based on the author's interview survey. Salaries for recruit clerical workers, recruit librarians, and librarians with five years' experience are compared along with hours of work per week and fringe benefits. Cost of living differences in metropolitan areas and collective bargaining are found to be strongly associated with differences in labor compensation. The collective bargaining differential for experienced librarians seems to be about 13.5 percent.

Money Stock Revisions and Unanticipated Money Growth

Robert J. Barro and **Zvi Hercowitz**
Working Paper No. 329
March 1979

An important "empirical regularity" is the strong positive effect of money shocks on output and employment. One strand of business cycle theory relates this finding to temporary confusions between absolute and relative price changes. These models predict positive output effects of unperceived monetary movements, but the quantitative importance of unperceived shifts in nominal aggregates is subject to question. Another strand of theory, based on long-term nominal contracts and analogous price-setting institutions, generates output effects from unanticipated, but not necessarily con-

temporaneously unperceived, money shocks. However, the real effects of unpredicted, but contemporaneously understood, monetary changes are not obviously consistent with efficient institutional arrangements. This paper provides some empirical evidence on the two types of theories by analyzing the output effects associated with revisions in the money stock data, where the revisions are interpreted as components of unperceived monetary movements. The revisions turn out to have no significant explanatory power for output. Previous findings that innovations from an estimated money growth equation have a significant output effect remain intact when the revisions are included as separate explanatory variables. Overall, the study provides a small amount of evidence against the special role of unperceived, as opposed to unanticipated, money movements as a determinant of business fluctuations.

Unionization and Productivity: Microeconometric Evidence

Kim B. Clark
Working Paper No. 330
March 1979

It is widely agreed that unionization affects the rules and procedures governing employment in organized establishments. The effect of these changes on the productivity of an establishment, however, is unclear. Existing evidence is based on a comparison of differences in the value added per hour worked for union and nonunion establishments. Although the positive effects of unions have been estimated, possible differences in prices and technology in the union and nonunion sectors render the results inconclusive. The effect of unions on productivity is examined in this paper, using data from the U.S. cement industry. The cement industry provides a useful empirical framework. Output is easily measured in physical terms, and data on both union and nonunion establishments permit estimation of the unions' effect when controlling for differences in technology. The results suggest that unionized establishments are 6–8 percent more productive than their nonunion counterparts. This conclusion is supported in time-series data, where a comparison of productivity before and after unionization reveals a positive effect of similar magnitude. Since the statistical analysis controls for capital-labor substitution, scale effects, and technological change, the evidence suggests that unionization leads to productive changes in the operation of the enterprise. The results are relatively robust. Specification changes and adjustments for omitted variables leave the basic findings intact.

Corporate Supply of Index Bonds

Stanley Fischer
Working Paper No. 331
March 1979

This paper develops a simple theory of the supply of index bonds and uses that model to examine, in some detail, possible reasons for the nonexistence of privately issued index bonds in the United States.

The major elements of the theory involve the tradeoff between the tax advantages of using debt finance and the increasing risk of bankruptcy that debt finance involves. The theory is first used to examine the supply of nominal bonds—it is thus a theory of the debt-equity ratio. Then the firm's optimal supply of index bonds is examined, and the values of the firm using the alternative debt instruments are compared. In general, there is no reason to think that nominal bonds dominate index bonds—i.e., the theory cannot explain why firms have not issued index bonds.

The paper then turns to a number of other reasons that have been advanced to explain why indexed bonds are not issued in the United States, such as the ambiguity over the possible tax treatment of such instruments and the argument that their issue would saddle the firm with open-ended obligations.

Unionization, Management Adjustment, and Productivity

Kim B. Clark
Working Paper No. 332
April 1979

This paper examines the effect of unionization on productivity using time-series data on selected establishments in the U.S. cement industry. The analysis combines a statistical estimation of the unions' impact and interviews with union and management officials to forge a link between econometric estimation and the traditional institutional analysis of union policy and management adjustment. The econometric analysis deals primarily with the problem of identifying the impact of the union in the face of the firm specific effects and adjustments in labor quality. The case studies are designed to shed light on the question of how unionization affects productivity. The empirical results support the conclusion that unionization leads to productive changes in the operation of the enterprise. Evidence from the case studies suggests that much of the gain in productivity derives from a series of extensive changes in management personnel and procedure. These adjustments are a management's response to changes in the employment contract which follow unionization.

Vehicle Currencies and the Structure of International Exchange

Paul Krugman
Working Paper No. 333
April 1979

This paper is concerned with the reasons why some currencies, such as the pound sterling and the U.S. dollar, have come to serve as "vehicles" for exchanges of

other currencies. It develops a three-country model of payments equilibrium with transaction costs and shows how one currency can emerge as an international medium of exchange. Transaction costs are then made endogenous, and it is shown how the underlying structure of payments limits (without necessarily *completely* determining) the choice and role of a vehicle currency. Finally, a dynamic model is developed, and the way in which one currency can displace another as the international medium of exchange is explored.

The Effect of Social Security on Saving

Martin Feldstein
Working Paper No. 334
April 1979

This paper, which was presented as the 1979 Frank Paish Lecture to the British Association of University Teachers of Economics, provides a nontechnical summary of the recent studies of the effects of social security on private saving. The first section discusses the theoretical indeterminacy of the effect of social security, while the second part reviews the empirical studies.

Although the traditional life cycle theory of saving clearly implies that the anticipation of social security benefits reduces private saving, a richer theoretical framework suggests several reasons why the saving response cannot be unambiguously established by theoretical reasoning. These reasons include the indirect effects of social security on retirement behavior, private pensions, and gifts and bequests.

The econometric studies resolve this uncertainty and indicate that social security appears to reduce private saving substantially. These studies include: (1) aggregate time-series evidence on the U.S. saving rates over the past fifty years, (2) microeconomic evidence on the accumulation of wealth by a large sample of individual households, and (3) international comparisons of saving rates in major industrial countries.

Feedback and the Use of Current Information: The Use of General Linear Policy Rules in Rational Expectations Models

Willem H. Buiter
Working Paper No. 335
April 1979

The behavior of several stochastic, dynamic, rational expectations models is studied when policy behavior can be described by a linear rule. Four policy components are distinguished: a current response component, a feedback component, an open-loop component, and a stochastic component. Policy is evaluated in terms of the current and asymptotic first and second moments of the state variables. The importance of distinguishing between variability and uncertainty is brought out. The

conditional variance is argued to be the appropriate measure of uncertainty. The analysis is applied to a model of foreign exchange market intervention.

Analyzing the Accuracy of Foreign Exchange Advisory Services: Theory and Evidence

Richard M. Levich
Working Paper No. 336
April 1979

With the introduction of floating exchange rates, the variability of unanticipated exchange rate changes has increased dramatically. A small forecasting industry has developed to provide information about future exchange rates. From an academic viewpoint, it is of interest to examine some of the statistical properties of these forecasts and to relate the forecast errors to other fundamental economic variables in a model with rational behavior. Second, from a more practical viewpoint, we would like to know if foreign exchange forecasts are useful to decision makers.

The purpose of this paper is to provide an objective analysis that addresses some of these questions for a large sample of forecasts. On the basis of the current research, we can draw several conclusions. First, most advisory service forecasts are not as accurate as the forward rate in terms of mean squared error. Second, judgmental forecasters are superior to econometric forecasters for short-term forecasts; the relationship is reversed for longer-term forecasts (one year). Third, two statistical tests indicate that the fraction of "correct" forecasts is significantly larger than what would be expected if the advisory services were only guessing at the direction of the future spot rate. In this sense, the forecast services appear to demonstrate expertise and usefulness. However, a full analysis of the risk-return opportunities available to advisory service users is still incomplete.

It should be cautioned that if the forward rate contains a risk premium, then we *expect* advisory service models to beat the forward rate according to the tests we have outlined. In this case, we must measure speculative returns relative to a risk measure. While advisory service forecasts may lead to profits, they may not be unusual after adjusting for risk.

Static and Dynamic Resource Allocation Effects of Corporate and Personal Tax Integration in the U.S.: A General Equilibrium Approach

Donald Fullerton, A. Thomas King, John B. Shoven, and **John Whalley**
Working Paper No. 337
April 1979

This paper presents estimates of static and dynamic general equilibrium resource allocation effects for four

alternative plans for corporate and personal income tax integration in the United States. A medium-scale numerical general equilibrium model is used that integrates the U.S. tax system with consumer demand behavior by household and with producer behavior by industry.

Results indicate that total integration of personal and corporate taxes would yield an annual static efficiency gain of around $4 billion (1973 dollars). Partial integration plans yield less. Dynamic effects are larger, and our analysis indicates that full integration may yield gains whose present value is as large as $400 billion or 0.8 percent of the discounted present value of the GNP stream to the U.S. economy, after correction for population growth. Plans differ in their distributional impacts, although these findings depend on the nature of the replacement taxes used to preserve government revenues. The size of dynamic resource allocation effects is sensitive to the choice of the replacement tax, while static gains are reasonably robust.

Private Versus Public Enforcement of Fines

A. Mitchell Polinsky
Working Paper No. 338
April 1979

Many undesirable activities are controlled by fines imposed by the government. In some contexts, such as antitrust violations and air pollution, it makes sense to consider giving the fine to a private party as an inducement for that party to discover and report the harmful behavior. This paper compares two "pure" forms of private enforcement—competitive and monopolistic—to public enforcement, allowing for the cost of enforcement to differ among the methods of enforcement. If the individuals engaging in undesirable activity can potentially be deterred, then regardless of relative enforcement costs, private (competitive or monopolistic) enforcement leads to less enforcement than public enforcement and is socially inferior to public enforcement if the damage from the activity is sufficiently large. When private enforcement is cheaper than public enforcement, regulating private enforcers, by paying them something different from the fine paid by each violator they detected, can achieve the socially most preferred outcome in the competitive case but not in the monopolistic case. If some individuals engaging in the activity cannot be deterred, these results hold if some simple additional conditions are satisfied. Also, depending on relative enforcement costs, monopolistic enforcement may result in more or less enforcement than competitive enforcement.

Unanticipated Money and Economic Activity

Robert J. Barro and **Mark Rush**
Working Paper No. 339
April 1979

This paper discusses ongoing research on the relation of money to economic activity in the post–World War II United States. As in previous work, the stress is on the distinction between anticipated and unanticipated movements of money.

Part I deals with annual data. Aside from updating and refining earlier analysis, the principal new results concern joint, cross-equation estimation and testing of the money growth, unemployment, output, and price level equations. The present findings raise some doubts about the specification of the price equation, although the other relations receive further statistical support.

Part II applies the analysis to quarterly data. Despite the necessity of dealing with a pronounced serial correlation of residuals in the equations for unemployment, output, and the price level, the main results are consistent with those obtained from annual data. Further, the quarterly estimates allow a detailed description of the lagged response of unemployment and output to money shocks. The estimates reveal some lack of robustness in the price equation, which again suggests some misspecification of this relation.

Macroeconomic Adjustment with Import Price Shocks: Real and Monetary Aspects

Michael Bruno and **Jeffrey Sachs**
Working Paper No. 340
April 1979

In this paper, we explore in detail the various ways by which the introduction of intermediate imports affects the comparative statics and the dynamics of adjustment in an open economy. The importance of integrating the role of intermediate imports into a theory of macroeconomic adjustment derives from the particular set of events that have affected the industrial economies in the 1970s—the unprecedented rise in raw materials prices, in particular the oil price shock, and the concomitant inflation and widespread unemployment.

The analysis lays out in detail the separate workings of the commodity, labor, and exchange rate markets, under various adjustment mechanisms, with the objective of obtaining empirically quantifiable hypotheses. An empirical study based on the present formulation has been prepared by the authors (see Bruno and Sachs, 1979).

On Activist Monetary Policy with Rational Expectations

Stanley Fischer
Working Paper No. 341
April 1979

This paper examines the case for activist monetary policy. It accepts the view that expectations are formed rationally, but not the implication of flexible price, equilibrium, rational expectations models that monetary policy cannot and should not be used to affect real magnitudes. The paper starts by asking why the economy

has not insulated itself from monetary disturbances through the adoption of indexing and other provisions that would effectively shorten contracts, and suggests that the costs of doing so must be substantial. These costs provide the rationale for activist policy, the aim of which should be to adjust for aggregate disturbances that the private sector has not made provision to handle. The arguments against activist policy are those familiar from earlier discussions by Milton Friedman: the long and variable lags with which policy operates and the alleged propensity of the Fed to misbehave. It is argued that an activist policy that does not respond to minor disturbances, but does respond to actual and prospective major disturbances, would provide a stabilizing force for the economy.

High School Preparation and Early Labor Force Experience
Robert H. Meyer and David A. Wise
Working Paper No. 342
May 1979

The relationship between high school training and work experience, on the one hand, and early labor force experience, on the other, are analyzed in this paper. In addition, the extent and nature of the persistence of early labor force experience is evaluated. The study is based on data for male youths from the National Longitudinal Study of the High School Class of 1972. While there appears to be no relationship between job related training in high school and the number of postgraduation weeks worked or the wage rates for these youths, there is a strong relationship between the hours they worked while in high school and both the number of weeks they worked and their wage rates in the first four years after graduation. High school class rank and test scores also are positively related to early weeks worked and wage rates in the labor force.

It is also found that after controlling for specific individual characteristics of these youths, there is little relationship between the number of weeks worked in the first year after high school graduation and the number of weeks worked four years later. And there is almost no relationship between initial wage rates and wage rates four years later, other than those attributable to measured and unmeasured specific individual characteristics. There is little persistence of early experience that cannot be attributed to heterogeneity among these youths. There is, however, an effect of early work experience on later wage rates, although it is of modest magnitude in this sample of high school graduates.

Coherency Conditions in Simultaneous Linear Equation Models with Endogenous Switching Regimes
C. Gourieroux, J. J. Laffont, and A. Monfort
Working Paper No. 343
May 1979

In modeling disequilibrium macroeconomic systems

that one would want to subject to econometric estimation, one typically faces the problem of whether the structural model can determine a unique equilibrium. The problem inherits a special form because the regimes in which the equilibria can lie are each linear. By placing restrictions on the parameters that ensure the uniqueness of such a solution for each value of the exogenous and random variables, we can improve the estimation procedure.

This paper provides necessary and sufficient conditions for uniqueness—i.e., coherency. These conditions are applied to a variety of models that have been prominent in the literature on econometrics with "switching regimes" such as those of self-selectivity (Maddala), simultaneous equation tobit and probit (Amemiya, Schmidt), and multimarket macroeconomic disequilibrium (Gourieroux, Laffont, and Monfort).

Aggregation Effects and Panel Data Estimation Problems: An Investigation of the R and D Intensity Decision
Ariel Pakes
Working Paper No. 344
May 1979

This paper considers why the determinants of the interindustry and intraindustry variance in R and D intensity in U.S. manufacturing differ markedly even though response parameters are similar across industries. A similar aggregation effect is noted by Grunfeld and Griliches (1960), and this paper gives that effect operational content in terms of grouped data estimation procedures. Observationally equivalent aggregation results can be generated by errors in variable models (see Aigner and Goldfeld, 1974). A later section considers specifications which identify the empirical importance of both these problems. Finally, a summary of the empirical results on the determinants of R and D intensity is provided.

A Note on the Derivation of Linear Homogeneous Asset Demand Functions
Benjamin M. Friedman and V. Vance Roley
Working Paper No. 345
May 1979

Among the numerous familiar sets of specific assumptions sufficient to derive mean-variance portfolio behavior from more general expected utility maximization in continuous time, the assumptions of constant relative risk aversion and joint normally distributed asset return assessments are also jointly sufficient to derive asset demand functions with the two desirable (and frequently simply assumed) properties of wealth homogeneity and linearity in expected returns. In addition, in discrete time, constant relative risk aversion and joint normally dis-

tributed asset return assessments are sufficient to yield linear homogeneous asset demands as approximations, if the time unit is small.

The Rate of Obsolescence of Knowledge, Research Gestation Lags, and the Private Rate of Return to Research Resources

Ariel Pakes and **Mark A. Schankerman**
Working Paper No. 346
May 1979

This paper points out the conceptual distinction between the rates of decay in the physical productivity of traditional capital goods and that of the appropriate revenues accruing to knowledge-producing activities, and notes that it is the latter parameter that is required in any study that constructs a stock of privately marketable knowledge. The rate of obsolescence of knowledge is estimated from a simple patent renewal, and the estimates are found to be comparable to evidence provided by firms on the life span of the output of their R and D activities. These estimates, together with mean R and D gestation lags, are then used to correct previous estimates of the private excess rate of return to investment in research. We find that after the correction, the private excess rate of return to investment in research, at least in the early 1960s, was close to zero, which may explain why firms reduced the fraction of their resources allocated to research over the subsequent decade.

Technical Systems and Innovations in Public Libraries

Malcolm Getz
Working Paper No. 347
May 1979

The extent of use of twenty innovations in the operation of public libraries is examined in thirty-one large public library systems across the country. The innovations include the use of computers in ordering, cataloging, and circulating materials. The pattern of diffusion of the innovations across the systems is explored using contingency tables and discriminant analysis. All the large library systems seem to participate in early adoption of some innovations; none seem to be pacesetters for all innovations. The extent of diffusion of some innovations may be reduced by the development of successive innovations that replace them. Only some of the innovations seem to be climax technologies that are likely to persist for longer periods of time.

Can the Fed Control Real Interest Rates?

Robert J. Shiller
Working Paper No. 348
May 1979

This paper examines three hypotheses concerning the extent to which rationally expected real interest rates can be controlled. These hypotheses, which are suggested by recent literature, all assert in some way that the stochastic properties of expected real interest rates are independent of Fed policy rules. This paper discusses the meaning and implications of the hypotheses, and then attempts to evaluate them on the basis of the Fed's "quasi-controlled experiments," historical changes in policy regimes, the Granger-Sims causality tests, Barro's unanticipated money regressions, and other methods. Finally, we discuss the relevance of any such methods.

The Incidence and Allocation Effects of a Tax on Corporate Distributions

David F. Bradford
Working Paper No. 349
May 1979

This paper analyzes a model where only corporate distributions to equity owners are taxed in order to isolate the effects of "double taxation" of dividend income both at the level of the corporation, and at the shareholder level. Contrary to the common view, the tax studied is shown to have no substitution effect and, in particular, no effect on the corporate choice between debt and equity (via retained earnings) finance. The analysis opens to question certain arguments commonly used to support integration of corporation and individual income taxes via dividend relief.

Measuring the Variance-Age Profile of Lifetime Income

Benjamin Eden and **Ariel Pakes**
Working Paper No. 350
May 1979

This paper presents an operational meaning to the concept of the variance in lifetime income in terms of the discounted variance of T mutually uncorrelated, sequentially realized, random variables. It is then shown how the logical implications of the life cycle consumption model can be used to estimate this series of variances, called the variance-age profile of lifetime income. We refer to an earlier paper by Eden (1977) to show how this variance-age profile can be used to compare the riskiness of alternative labor income paths. Finally, the estimation technique is applied to Israeli data in order to compare the riskiness of the earnings path of those who attended college with that of those who terminated their education at the high school level in that economy, and to consider data requirements and estimation problems in greater depth.

Social Security and Retirement: Evidence From the Canada Time Series

Anthony J. Pellechio
Working Paper No. 351
May 1979

This study examines the influence of social security on the aggregate retirement rate in Canada. The life cycle model of individual behavior that indicates how social security can affect an individual's decision to retire provides the foundation for this study. The model is further used to specify the social security wealth variable, the present value of the social security benefits to which an individual is entitled, and to measure this retirement effect. Individual retirement decisions are used to estimate the aggregate retirement rate.

Time-series data from Canada include one measure of social security wealth that matches the specification given by the life cycle model. The estimate of the model yields evidence that social security does induce retirement: an increase in social security wealth of approximately $2,300 per capita (measured in 1971 dollars) has been estimated to raise the retirement rate by 5 to 6 points. The creation of the Canada and Quebec Pension Plan raised the retirement rate by 1.5 points in 1967.

Time Preference and International Lending and Borrowing in an Overlapping Generations Model

Willem H. Buiter
Working Paper No. 352
May 1979

This paper analyzes the consequences for capital formation and welfare of different pure rates of time preference. Two economies with different pure rates of time preference are considered under autarky and as participants in a single-world economy characterized by international trade and international lending and borrowing. The "thrifty" country has a current account surplus in long-run equilibrium. Outside the steady state it is possible that the "impatient" country temporarily runs a current account surplus. The common open economy capital-labor ratio lies between the low autarky capital-labor ratio of the impatient country and the high capital-labor ratio of the thrifty country. During the change from autarky to openness, the young generation in the impatient country experiences a welfare loss; the young generation in the thrifty country gains. The paper represents a first step toward reformulating international trade theory in terms of overlapping generations models— an analytical framework that has been extremely useful in public finance and macroeconomics. In spite of its high level of abstraction, the analysis may shed some light on the reasons behind the current account surpluses of high-saving countries like Japan and Germany and the chronic deficits of low-saving countries like the United Kingdom and the United States.

Estimating the Determinants of Employee Performance

Charles Brown
Working Paper No. 353
May 1979

Employers often wish to know whether the factors used in selecting employees do in fact allow them to choose the most qualified applicants. Because the performance of those not chosen is not observed, sample selection bias is a likely problem in any attempt to "validate" employee selection criteria. With minor modifications, the recently developed techniques for dealing with sample selection problems can be used in this context.

Using data on applicants for first-line supervisory positions and ratings of on-the-job performance of those hired, ordinary least-squares estimates of the determinants of performance are compared with maximum-likelihood estimates that correct for selection bias. The correction for selection bias produces some appreciable improvements in some variables' coefficients, although the corrected estimates remain insignificant at conventional levels. Differences in the firm's stated and actual hiring criteria are also noted.

Optimal Inflation Policy

Lawrence H. Summers
Working Paper No. 354
May 1979

This paper considers the problem of optimal long-run monetary policy. It shows that optimal inflation policy involves trading off two quite different considerations. First, increases in the rate of inflation tax the holding of many balances, leading to a deadweight loss as excessive resources are devoted to economizing on cash balances. Second, increases in the rate of inflation raise capital intensity. As long as the economy has a capital stock short of the golden rule level, increases in capital intensity raise the level of consumption. Ignoring the second consideration leads to the common recommendation that the money growth rate be set so that the nominal interest rate is zero. Taking it into account can lead to significant modifications in the "full liquidity rule." Interactions of inflation policy with financial intermediation and taxation are also considered. The results taken together suggest that inflation can have important welfare effects and that optimal inflation policy is an empirical question, which depends on the structure of the economy.

International Differences in Social Security and Saving

Martin Feldstein
Working Paper No. 355
May 1979

The U.S. Social Security Administration, in coopera-

tion with similar agencies in other countries, recently developed estimates of social security benefits for twelve major industrial countries. More specifically, these estimates provide information on the ratio of social security pension to preretirement earnings for a newly retired couple in which the man had the average earnings in manufacturing industry.

The present paper uses these new data to estimate the effects of social security benefits on saving and retirement in an extended life cycle model. The parameter estimates indicate that, with retirement behavior given, social security significantly reduces private saving; an increase of the benefit-to-earnings ratio by 10 percentage points reduces the saving rate by approximately 3 percentage points. The reduced form parameter indicates that allowing for the effect on saving of induced retirement lowers this implied decrease in saving from 3 percentage points to about 2 percentage points.

International Trade and Income Distribution: A Reconsideration

Paul Krugman
Working Paper No. 356
June 1979

The postwar expansion of trade among the industrial countries has not had the strong distributional effects that standard models of trade would have led us to expect. This paper develops a model that attempts to explain this observation, while at the same time making sense of some other puzzling empirical aspects of world trade.

The basis of the model is a distinction between two kinds of trade: "Heckscher-Ohlin" trade, based on differences in factor proportions, and "intraindustry" trade, based on scale economies and product differentiation. To incorporate intraindustry trade into the model, it is necessary to drop the usual assumptions of constant returns to scale and perfect competition; instead, the paper deals with a world where economies of scale are pervasive and all firms possess some monopoly power. Surprisingly, it is nonetheless possible to develop a fully worked-out general equilibrium model which remains simple and can be used to compare autarky and free trade.

Two main results emerge from the analysis. First, the nature of trade depends on how similar countries are in their factor endowments. As countries become more similar, the trade between them will increasingly become intraindustry in character. Second, the effects of opening trade depend on its type. If intraindustry trade is sufficiently dominant the advantages of extending the market will outweigh the distributional effects, and the owners of scarce as well as of abundant factors will be made better off.

Labor Mobility and Wages

Jacob Mincer and **Boyan Jovanovic**
Working Paper No. 357
June 1979

In this essay, the implications of human capital and search behavior for both the interpersonal and life cycle structure of interfirm labor mobility are explored. The economic hypothesis that motivates the analysis is that individual differences in firm-specific complementarities and related skill acquisitions produce differences in mobility behavior and in the relation between job tenure, wages, and mobility. Both "job duration dependence" and "heterogeneity bias" are implied by this theory. Exploration of longitudinal data sets (NLS and MID) that contain mobility, job, and wage histories of men in the 1966–76 decade yield the following findings, among others:

1. The initially steep and later decelerating declines of labor mobility with working age are in large part due to the similar but more steeply declining relation between mobility and length of job tenure.
2. Given tenure levels, the probability of moving is predicted positively by the frequency of prior moves and negatively by education. The inclusion of prior moves in the regression reduces the estimated tenure slope because it helps to remove the heterogeneity bias in that slope.
3. The popular "mover-stayer model" is rejected by the existence of tenure effects on mobility.
4. Differences in mobility during the first decade of working life do not predict long-run differences in earnings. However, persistent movers at later stages of working life have lower wage levels and flatter life cycle wage growth curves.
5. The analysis calls for a reformulation of earnings (wage) functions.

Inclusion of tenure terms in the function permits separate estimates of returns to general and specific human capital after correction for heterogeneity bias. A rough estimate is that 50 percent of lifetime wage growth is due to general (transferable) experience and 25 percent each to firm-specific experience and interfirm mobility.

The Structure of Production, Technological Change, and the Rate of Growth of Total Factor Productivity in the Bell System

M. Ishaq Nadiri and **Mark A. Schankerman**
Working Paper No. 358
June 1979

The objectives of this preliminary study are threefold. The first is to analyze empirically the production structure of the Bell System at the aggregate level. Particular attention is focused on the pattern of substitution among the factor inputs and the degree to which the aggregate production function is characterized by economies of scale. In this connection, we explore the role of research

and development in the Bell System as an input to the production process and as it interacts with the traditional inputs. Second, we examine the impact of external technological change on the production structure of the Bell System. The issues here include not only the rate of such technical change, but also the extent to which it alters the optimal level and mix of inputs, that is, the factor bias of external technical change. The third objective is to explore the interrelationship between scale economies internal to the Bell System and external technical change in determining the rate of growth of total factor productivity (TFP). Specifically, we propose and illustrate a methodology for decomposing the observed growth of TFP into a part related to scale economies and a part induced by technical change. We address these issues by first estimating an aggregate translog cost function for the Bell System, using annual data for the period 1947–1976. The implied estimate of the scale economies is then used to explore the sources of the growth of TFP.

Price Expectations, Foreign Exchange and Interest Rates, and Demand for Money in an Open Economy

Sebastian Arango and **M. Ishaq Nadiri**
Working Paper No. 359
June 1979

Traditional studies of demand for money have often ignored the influence of foreign monetary developments. The literature on international capital mobility, on the other hand, focuses on the impact of adjustments in international reserves on domestic money supply with the implicit assumption that aggregate demand for money is inelastic with respect to foreign monetary developments such as changes in exchange and foreign interest rates. These two views have often led to the conclusion that domestic monetary policy is fairly ineffective, and domestic financial markets are highly vulnerable to changes in foreign monetary developments.

In this paper, the formulation of a demand function for real cash balances generalizes the traditional demand functions for money that explicitly take into account changes in exchange rates, foreign interest rates, and inflationary expectations. The underlying theoretical model is a general portfolio model of asset holding that specifies the channels through which the influence of monetary developments abroad are transmitted to the supply and demand for money in a particular country. The demand function for real cash balances derived from this model is estimated using the time-series data for the period 1960–75 for Canada, United States, United Kingdom and Germany. The results indicate that foreign monetary developments affect demand for money significantly, and considerable misspecification occurs when they are ignored. The results indicate that demand for real cash balances is not, as the traditional theory suggests, inelastic with respect to changes in foreign financial developments and is fairly stable over the stressful period of 1970–75 when significant international monetary crises came in succession.

Contributions and Determinants of Research and Development Expenditures in the U.S. Manufacturing Industries

M. Ishaq Nadiri
Working Paper No. 360
June 1979

This paper is an attempt to assess the contribution of R and D to growth of output in U.S. manufacturing industries. The important issues to address are: (1) whether the slower growth of R and D expenditures in recent years has been the cause of the slowdown in the growth of productivity and (2) what are the factors that explain the slower growth of R and D expenditures. After a brief survey of the major issues on this topic, a production function is formulated and estimated using time-series cross-section data for the manufacturing industries. Also, the factors determining the rate of growth of R and D expenditures in the 1958–75 period are identified by formulating a dynamic model of demand for R and D activity.

The estimation results indicate that the stock of R and D, as a measure of stock of knowledge, positively and strongly affect growth of output in total manufacturing, total durable, and total nondurable industries. Potential growth of output is affected because of the slowdown of growth of stock of R and D since 1966, but the gross rates of return on stock of R and D have not changed much in the 1966–75 period. Growth of output, changes in relative prices, cyclical fluctuations in the economy, as well as changes in the level of employment and capital stocks are the factors affecting R and D expenditures. The effect of government financing of R and D on private decisions regarding R and D expenditures differs among different industries. By and large, the results on this issue are basically inconclusive and require further investigation.

New Evidence that Fully Anticipated Monetary Changes Influence Real Output After All

Robert J. Gordon
Working Paper No. 361
June 1979

A new empirical study of the relation between money, nominal income, prices, and real output in postwar quarterly U.S. data rejects virtually all of the conclusions reached by Robert Barro in his three papers on the topic (*AER* 1977, *JPE* 1978, and 1978 conference paper with Mark Rush). A distinction is drawn between the Lucas-Sargent-Wallace (LSW) theory that only unanticipated monetary chages influence real output and the orthodox view that anticipated monetary changes influence real

output in the short run during the interval of adjustment to the monetary change. The LSW proposition requires for its validity a contemporaneous and equiproportionate response of the expected price level to the anticipated level of money or nominal GNP, whereas the orthodox approach requires that price expectations depend at least partly on the past history of prices rather than entirely on the expected level of nominal demand.

The results uniformly support the orthodox approach. The Livingston expectations series exhibits a highly significant response to past price changes and only a slight response to current expectations about nominal GNP or money. The actual inflation rate also depends heavily on past price changes, with an insignificant impact of current expectations of nominal GNP, or money. The equations that relate real output to the deviation of changes of nominal income (both anticipated and unanticipated) from past price changes fit the data significantly better than Barro's approach using current and lagged values of money "surprises." The pure version of the LSW approach relating real output only to current surprises is decisively rejected.

The Family as an Incomplete Annuities Market

Laurence J. Kotlikoff and **Avia Spivak**
Working Paper No. 362
June 1979

Families provide individuals with risk-sharing opportunities that may not otherwise be available. Within the family there is a degree of trust and a level of information that alleviates three key problems in the provision of insurance by markets open to the general public: moral hazard, adverse selection, and deception. The informational advantages of pooling risk within families must be set against the inability of families to provide complete insurance because of their small size as a risk-pooling group.

This paper demonstrates how families can provide insurance against uncertain dates of death. Family arrangements for sharing the risk of death effectively constitute an incomplete annuities market. Our analysis indicates that these arrangements, even in small families, can substitute by more than 70 percent for complete annuities. Given the adverse selection problem and transactions costs in public annuity markets, risk pooling in families may well be preferable to purchasing market annuities. In the absence of organized public markets in annuities, these risk-sharing arrangements provide powerful economic incentives for marriage and family formation.

This paper suggests that interfamily transfers need have nothing to do with altruistic feelings; rather, they simply reflect risk-sharing behavior of completely selfish family members.

Can Productive Capacity Differentials Really Explain the Earnings Differentials Associated with Demographic Characteristics?: The Case of Experience

James L. Medoff and **Katharine G. Abraham**
Working Paper No. 363
June 1979

This study uses computerized personnel microdata on the white male managerial and professional employees in a major U.S. corporation to address the following question: Can the additional earnings that are associated with more labor market experience at a point in time really be explained by higher productivity at the same point in time? Our answer to this question, based on both cross-sectional and longitudinal information, is that performance plays a substantially smaller role in explaining cross-sectional experience-earnings differentials or earnings growth than is claimed by those who have adopted the human capital explanation of the experience-earnings profile. Since our response to the question under analysis depends critically on our having assumed that the performance ratings that supervisors give (individually or collectively) to their white managerial and professional subordinates adequately reflect the subordinates' relative productivity in the year of assessment, we present a great deal of evidence that very strongly supports this assumption.

The Two Faces of Unionism

Richard B. Freeman and **James L. Medoff**
Working Paper No. 364
June 1979

This study delineates and assesses the relative accuracy of two views of trade unions in the United States. In the first, which we call the "monopoly" view, unions are a detrimental force in advanced capitalist systems; unions do little more than raise the wages of their members beyond what they would otherwise be, increasing the degree of economic inefficiency and inequality. In the second, which we refer to as the "collective voice-institutional response" view, unions provide workers with collective voice, which is essential in the absence of meaningful opportunities for individual exit. This voice elicits institutional responses that dramatically change the nature of the employment relationship and, in so doing, increase the levels of productivity and equality in many settings.

The evidence presented indicates that those who focus on the monopoly face of unionism and ignore the collective voice-institutional response view are likely to hold erroneous beliefs about unions in this country. The facts indicate that, on net, unions do *not* reduce the efficiency or equality and are generally democratic and non-corrupt.

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