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# Program Report

## Taxation

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Since the last article on the tax program in the Summer 1979 *NBER Reporter*, a name change from Program in Business Taxation and Finance to Program in Taxation has taken place, reflecting a broader scope of research. While the objective of the program is still to provide quantitative information useful in predicting the effects of alternative tax institutions, with a special concern for the accumulation and allocation of capital, a new attention to tax influences on such activities as labor supply, tenure choice in housing, and exploitation of natural resources has been added. Prospective work on taxation in systems of governments, particularly the system of U.S. states, is also planned. At the same time, there has been continued interest in the issues that emerged in the early stages of the program such as:

(1) What are the effects of existing rules on the portfolio choices of savers? Is there a segmentation of the market, with certain assets, such as real estate or low-dividend stock, concentrated in the hands of high-bracket taxpayers and others, such as bonds and high-dividend stock, held mostly by tax-exempt institutions?

(2) Can one measure the efficiency cost of distortions in corporate debt-equity ratios brought about by the tax system?

(3) What is the effect of the tax system on the level of savings and investment?

(4) In view of the advantageous tax treatment of capital gains, why do corporations pay out as much as they do in dividends?

(5) How can one design practical tax rules to neutralize the influence of inflation on the taxes bearing on investment and portfolio decisions?

(6) Who bears the burden of state corporation income taxes?

In addition to these issues concerned primarily with capital income taxation, questions such as the following have been addressed:

(7) What guidance does economic analysis give for the income tax treatment of the family, and especially of married couples? Using currently available knowledge about behavioral responses, what do we know about the revenue and labor supply consequences of alternative approaches to eliminating the "marriage tax"?

(8) How can one take into account aspects of quality and intensity of effort in measuring "labor supply"? What is the efficiency cost of present income and payroll taxation of labor supply?

(9) How can one measure the degree of income equality in an economy and what can one say about the effect of taxes on it?

It is impossible in a short summary to comment on all

**In This Issue**



This issue of the *Reporter* highlights the Bureau's Program in Taxation. Next, Lawrence Summers discusses some of his work on inflation and taxes, and James Medoff and Katharine Abraham describe certain of their studies on seniority in the U.S. workplace. After the quarterly Economic Outlook Survey are a section of biographical sketches and news of NBER conferences, the Conference Calendar, and other NBER news and reports. The *Reporter* concludes with short summaries of recent NBER Working Papers.

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of the research that has been done under the tax program. Instead, an overview of activity in four broad and related subject areas—simulation of the effect of taxes, taxation and inflation, taxation and corporation finance, and tax incentives for saving and investment—follows.

## Simulation of the Effects of Taxes

Simulating the effect of tax changes has long been a basic tool of policy makers. "Simulation" may mean nothing more than projecting revenue consequences, or it may extend to considerable detail. Improvements in computing capacity, econometric technique, and the available statistical information have made possible continuing progress in simulation. Bureau Research Associate John Shoven and Faculty Research Fellow Don Fullerton have been at the forefront of the use of computable models of the full system of markets in the economy for analyzing tax changes. These models take into account the feedback of changes in one sector on activity and revenues in other sectors. One example would be the effect of tax subsidies to mineral development on the prices of automobiles, and thus on employment, income tax receipts, and so on in the latter sector. Fullerton applied this approach to the likelihood that supply-side responses to general reductions in the tax rates would actually increase tax resources.[1] He concluded that as far as the responses of the major aggregates—labor supply and capital stock—and their industrial allocation are concerned, available evidence puts the U.S. tax rates well below the level that would maximize revenue.

One of the advantages of general equilibrum modeling, as this type of analysis is called, is the discipline it imposes since it requires fully consistent accounting with careful attention to all tax and other payment flows. These include not only the major federal taxes but also state and local sales, income, payroll, excise, and property taxes. Not always appreciated is how difficult it can be to determine, for example, what specific tax is applicable to a decision to make a given investment. To answer the question in a historical sense requires painstaking assembly of accounting data from many sources, with difficult judgments required at many stages. Shoven, Fullerton, and their colleagues have made important contributions to a steady advance in the construction of a consistent and carefully documented information base for this work.

Even good accounting information, however, leaves the analyst with challenging questions. One of the more important and interesting is the interpretation to be given to average tax rates, that is, ratios of tax payments in the accounts to the corresponding factor payment flows. Since accounting data reflect a variety of previous decisions and circumstances, there may be a considerable divergence between average tax rates and the marginal rates impinging on decisions to invest at a given time. There is, in addition, the question of how the tax bearing

[1] *D. Fullerton, "On the Possibility of an Inverse Relationship between Tax Rates and Government Revenues," NBER Working Paper No. 467, April 1980.*

on the risk premium demanded by investors should be modeled.

These matters will be mentioned in connection with other work discussed below, but a provocative simulation study, carried out by Fullerton and Research Associate Roger Gordon, should be singled out here.[2] In a recent study, Fullerton and Gordon scrutinize and amend a whole series of assumptions conventionally used by analysts to convert accounting data into marginal tax rates. The implication is a surprising reduction, by comparison with earlier studies, in the estimated efficiency cost of taxation. The Fullerton-Gordon calculations will no doubt be a matter of continued lively discussion among Bureau tax researchers.

The Fullerton-Gordon paper was one of several prepared for a conference on Simulation Methods in Tax Policy Analysis held on January 26-27, 1981 (see *NBER Reporter*, Spring 1981, p.14). Four of the papers presented at the Tax Simulation Conference made use of the large NBER data set known as TAXSIM. TAXSIM consists of a series of samples of federal individual income tax returns, representative of the entire population of taxpayers in each of several years. Under the management of Research Economist Daniel Feenberg, over the last two years the software required to use these files to calculate the effect of tax changes in tax rules has been substantially extended. Feenberg has developed programs to "age" the files to simulate years subsequent to the latest actual sample year and to impute to the file data not actually reported on returns. The Bureau thus has a capacity comparable to that of the U.S. Treasury and Congress to calculate the impact effects of income tax changes. The aging and imputation techniques Feenberg has developed have a sound footing in statistical theory and the streamlined techniques result in economies in use. Feenberg has also incorporated into the tax calculating programs information about state tax systems. This will permit improved measurement of aggregate marginal tax rates. In addition, it makes possible cross-sectional estimates of behavioral response based on information about a taxpayer's address.

Perhaps the most important aspect of the Bureau's TAXSIM project has been the effort to incorporate the response of individual behavior to proposed changes in the tax rules. The papers presented at the Tax Simulation Conference indicate the power of this tool. Experience with these applications has shown both how difficult it is to build in taxpayer responses—in view of the limited knowledge of response parameters and limited information about taxpayer characteristics—and how useful it will be to continue the effort.

As far as the key parameters are concerned, Bureau researchers have been making significant contributions. Research Associate Patric H. Hendershott and James D. Shilling have studied the economics of the choice between renting and buying housing.[3] (They estimate, incidentally, that the combined effects of inflation and tax increases on rental housing led to a roughly 10 percent greater homeownership rate as of 1978 than would have prevailed under a continuation of the conditions of the late fifties.)

Jerry Hausman has brought to bear innovative estimation techniques to deal with the fact that the tax rules result in household budget constraints that are nonlinear.[4] The graduated income tax schedule, for example, implies that the net wage declines as the taxpayer works more at a given pretax wage. Because tax changes typically involve nonlinear elements, it is particularly important to account correctly in quantitative modeling for this aspect of the problem of the household's choice. Hausman's estimates suggest that efficiency costs rise rapidly at the margin as tax rates are raised, because of the labor supply responsiveness in the corresponding range.

## Taxation and Inflation

As rates of inflation have persisted at high levels, it is not surprising that the interaction of inflation and taxes has continued to attract the attention of Bureau researchers. As far as the continuing allocation effects of inflation are concerned, these interactions are crucial. In a world without taxes one would expect adjustments in financial markets—the addition of an inflation premium to interest rates, for example—to reduce to a minimum the distortions due to any given, steady inflation rate. The same conclusion would apply in a world of well-indexed taxes —in which, for example the inflation premium is excluded from interest in calculating taxable income. However, because the tax system is far from perfectly indexed, inflation has systematic and differential effects on the real yield from different assets.

Research Associate Joseph Stiglitz has provided an extended overview of the distortions and welfare losses associated with inflation.[5] He emphasizes as the major source of distortion the failure of the tax system to be fully indexed. As he points out, it is difficult to make general statements about the effect inflation has on resource allocation because, without full indexation, when the rate of inflation changes, either government expenditure, the real value of the deficit, or taxation rates must adjust. The precise nature of the equilibrium that emerges depends upon the nature of these adjustments.

Bureau President Martin Feldstein has continued to work on the consequences of inflation for asset prices and portfolio choice, extending earlier work on the effect of inflation on common stock prices.[6] His new study takes into account the influence of corporate debt, retained earnings, and diverse shareholder tax rates in determining the influence of changes in the expected infla-

[2] *D. Fullerton and R. Gordon, "A Reexamination of Tax Distortions in General Equilibrium Models," NBER Working Paper No. 673, May 1981.*

[3] *P. Hendershott and J. Shilling, "The Economics of Tenure Choice: 1955-79," NBER Working Paper No. 543, September 1980.*

[4] *J. Hausman, "Income and Payroll Tax Policy and Labor Supply," NBER Working Paper No. 610, December 1980.*

[5] *J. Stiglitz, "On the Almost Neutrality of Inflation: Notes on Taxation and the Welfare Costs of Inflation," NBER Working Paper No. 499, July 1980.*

[6] *M. Feldstein, "Inflation, Tax Rules, and the Stock Market," NBER Working Paper No. 403, November 1979.*

tion rate. In his model an increase in the inflation rate can have a substantial effect on share prices per dollar of pretax earnings.

Research Associate Roger Gordon has also studied the effect of inflation on corporate behavior, modeling corporate financial and real decisions simultaneously.[7] He concludes that while the observed doubling of corporate debt-value ratios during the period of rapidly increasing inflation in the United States can indeed be rationalized solely by the interaction of inflation and the tax laws, the decline in the stock market and the level of investment are larger than would have been forecast solely by the increased inflation rate. Pursuing a different approach, Research Associate Lawrence Summers has also estimated the effect of inflation on the stock market and investment.[8] His conclusions are broadly similar to those of Gordon. Simulations he conducts indicate that an increase in the rate of inflation from zero to 8 percent would cause an immediate 23 percent decline in the stock market, and ultimately a 35 percent increase in the capital stock. He also finds that the estimated speed of adjustment of the capital stock is quite slow.

Feldstein has also extended earlier work that emphasizes real estate and related assets as forms of wealth in addition to industrial capital.[9] This theoretical work is particularly important for its explicit treatment of the riskiness of alternative assets. A perennial difficulty for the analyst is rationalizing the apparent failure of financial markets to equate the expected aftertax rate of return on different forms of investment. Feldstein shows in his analysis of portfolio choice among bonds, stock, and land that risk parameters may play a crucial part in interpreting such phenomena as the negative real rates of interest applicable to corporations and other high-bracket taxpayers that have persisted in recent years.

In related work, Research Associate Patric Hendershott has emphasized the place of owner-occupied housing in taxpayer portfolios.[10] According to his analysis the decline in stock market values can most importantly be attributed to portfolio shifts due to the favorable taxation of income from owner-occupied housing (no taxation of either implicit rent or real capital gains).

Two other Bureau studies have supported these conclusions about the effect of inflation on the relative value of owner-occupied housing. James Poterba's simulation results suggest that the inflation-tax interaction could have accounted for as much as a 30 percent increase in real house prices in the 1970s.[11] The persistence of current inflation rates, he concludes, could lead ultimately to a 20 percent increase in the housing stock. Lawrence Summers's examination stressing the differential treatment of industrial capital and owner-occupied housing leads him to conclude that tax effects have been large enough to account for almost the entire relative price shift in the value of the stock market and of owner-occupied housing for the last decade.[12]

While these various studies display considerable consistency, it is evident from the differences in the findings about the stock market of Feldstein, Hendershott, Gordon, and Summers that there remains much we do not understand about the behavior of asset prices under inflation. The importance of tax rules in the analysis, however, is clearly established.

## Taxation and Corporation Finance

The influence of taxation on the investment and financing decisions of corporations has continued to occupy the attention of Bureau researchers. By now the question of why corporations pay dividends has become something of an old friend, a continuing reminder of the limits of simple models in comprehending a complex reality. One explanation, developed by Research Associate Myron Scholes and Merton Miller of the University of Chicago, is that legal limits on the deductibility of interest payments have the effect of eliminating the individual tax on dividends.[13] The authors argue that because extra dividends increase the allowable deduction of investment interest, shareholders will simply offset dividends with increased borrowing. In support of their analysis, Miller and Scholes had available only grouped income tax data. Research Economist Daniel Feenberg used the TAXSIM file of individual tax returns to show that the limitation on investment interest could apply to at most a minuscule fraction of individual dividend recipients, making any significant role extremely improbable for this tax rule in explaining the continued magnitude of dividend payout.[14]

Within the context of models thus far developed, dividend payout involves apparent irrationality on the part of corporate managers or shareholders or both. A study by Research Associates David Bradford and Roger Gordon suggests that, on average, corporate managers seem to be behaving sensibly, and it is the shareholders whose behavior needs explaining.[15] Bradford and Gordon study the trade-off between dividends and capital gains on common stock traded on the New York Stock Exchange over the past fifty years. Since corporations have the option to issue or buy back shares as well as to pay out divi-

[7] *R. Gordon, "Inflation, Taxation, and Corporate Behavior," NBER Working Paper No. 588, December 1980.*

[8] *L. Summers, "Inflation, Taxation, and Corporate Investment: A Q Theory Approach," NBER Working Paper No. 604, August 1980.*

[9] *M. Feldstein, "Inflation, Portfolio Choice, and the Price of Land and Corporate Stock," NBER Working Paper No. 526, August 1980.*

[10] *P. Hendershott and Sheng Cheng Hu, "Inflation and the Benefits from Owner-Occupied Housing," NBER Working Paper No. 383, August 1979.*

[11] *J. Poterba, "Inflation, Income Taxes, and Owner-Occupied Housing," NBER Working Paper No. 553, September 1980.*

[12] *L. Summers, "Inflation, the Stock Market, and Owner-Occupied Housing," NBER Working Paper No. 606, December 1980.*

[13] *M. Miller and M. Scholes, "Dividends and Taxes,"* Journal of Financial Economics, *November 1978.*

[14] *D. Feenberg, "Does the Investment Interest Limitation Explain the Existence of Dividends?" NBER Working Paper No. 530, August 1980.*

[15] *D. Bradford and R. Gordon, "Taxation and the Stock Market Valuation of Capital Gains and Dividends: Theory and Empirical Results," NBER Working Paper No. 409R, November 1979.*

dends, maximizing by managers should imply a one-to-one trade-off between dividends and anticipated price appreciation. The data suggest substantial movement in this (implicit) price but are consistent with the view that it varies around one. If accepted, this finding would imply that we should seek an explanation of dividends in preferences of shareholders, for they should want to "buy" capital gains and "sell" dividends at a one-to-one price.

The Bradford-Gordon analysis represents shareholders as balancing tax and portfolio diversification advantages. Bureau President Martin Feldstein and Research Associate Jerry Green have developed a theoretical model in a similar vein.[16] They show that value-maximizing firms may distribute funds currently even though postponing distribution would provide their shareholders subsequently with more favorably taxed capital gains. The Feldstein-Green argument hinges on the conflicting preferences of shareholders in different tax brackets prevented from going their separate ways by the desire for portfolio diversification. The argument does not, however, resolve the question of why corporations should choose dividends rather than share repurchase or other more lightly taxed distribution routes.

Both of these analyses involve shareholder portfolios that are influenced by tax considerations, with high-bracket taxpayers favoring low-dividend firms. Faculty Research Associate Patrick Hess has studied this issue directly.[17] He is able to formulate several equilibrium pricing models incorporating differential taxation of dividends and capital gains as nested systems of time-series regressions. His conclusion is agnostic, as the tests performed failed to support these models as well as the hypothesis that the size of the dividend component of the return on stock has no effect.

Empirical work by Jerry Green, however, does support the existence of a clientele effect.[18] Green considers the question of what one can learn from the ex-dividend day behavior of common stock prices. Focusing on the determinants of the buy or sell timing decision of stockholders, Green shows that the usual argument by which a tax-induced clientele effect is inferred is incorrect. Estimates based on his correctly formulated model strongly support a clientele effect.

A different clientele effect is emphasized in further work. Research Associates Alan Auerbach and Mervyn King have constructed a theoretical model similar in spirit to that of Feldstein and Green mentioned above, to study the relative proportions of debt and equity in the corporation's financial structure.[19] By exploring a highly simplified model, they are able to be quite precise about the conditions under which equilibrium may exist and the role that is played by constraints on individual and firm behavior. Under certain conditions in their model, investors are sharply differentiated by tax rate into two groups, one specializing in equity and the other in debt. Although the relative wealths of the two groups determine the aggregate debt-equity ratio, each firm is indifferent to its financial policy.

Support for the empirical relevance of this conclusion is found in work undertaken with the help of a grant from the Bureau to Professors Paul Grier and Paul Strebel, of the State Univesity of New York at Binghamton.[20] Grier and Strebel develop a measure of the extent to which the tax system favors debt over equity finance and compare its movement over time with the behavior of observed debt-equity ratios. They conclude that the data support the responsiveness of corporations to the relative tax incentive that their investors have to hold debt.

I have mentioned the stress placed by Auerbach and King on the requirements for constraints on behavior of investors in corporations in order to determine equilibrium in models with separate corporation and individual income taxes and multiple rates of individual tax. A typical problem for which a constraint is necessary is the apparent incentive for corporations to go to extremes in financial structure. For example, wealth maximizing may appear to imply that corporations should go infinitely into debt in order to exploit the tax advantage of doing that for a finance period. While the approach of imposing assumed constraints on corporate financial structure is convenient for the analyst, it is not as satisfying as an explanation for the constraint that grows out of the economics of the situation.

Such an analysis is provided by Research Associates Roger Gordon and Burton Malkiel in a paper analyzing the effects of the federal tax structure on corporate financial and investment behavior.[21] Their model takes into account both uncertainty and the crucial feature of bankruptcy costs. Their forecasts prove consistent with both observed cross-sectional variation in debt-equity ratios and the time-series pattern of debt-equity ratios. The model implies that the federal tax structure induces quite substantial efficiency costs through the distortion in financial structure, indeed, costs that seem to be more important than the distortion in allocation between corporate and noncorporate sectors that is usually stressed.

## Tax Incentives for Savings and Investment

The mischievous effects of inflation, the low rate of net investment in the U.S. economy, and the disappointing record of growth in labor productivity in recent years have kept active the subject of the taxation of savings and investment in both policy and academic circles. The discussion has involved controversial questions of theo-

[16] *M. Feldstein and J. Green, "Why Do Companies Pay Dividends?" NBER Working Paper No. 413, December 1979.*

[17] *P. Hess, "Dividend Yields and Stock Returns: A Test for Tax Effects," NBER Working Paper No. 649, March 1981.*

[18] *J. Green, "Taxation and the Ex-Dividend Day Behavior of Common Stock Prices," NBER Working Paper No. 496, July 1980.*

[19] *A. Auerbach and M. King, "Taxation, Portfolio Choice, and Debt-Equity Ratios: A General Equilibrium Model," NBER Working Paper No. 546, September 1980.*

[20] *P. Grier and P. Strebel, "An Implicit Clientele Test of the Relationship between Taxation and Capital Structure," NBER Working Paper No. 481, June 1980.*

[21] *R. Gordon and B. Malkiel, "Taxation and Corporation Finance," NBER Working Paper No. 576, November 1980.*

ry and of empirical fact. A broad overview of the economics of these issues was provided by Research Associate David Bradford.[22] Bradford stresses four principal points: (1) The present tax treatment of savings and investment is distinguished above all by inconsistency. (2) In a choice among ideally consistent tax structures the "optimal" (second-best) tax on investment income depends upon the behavioral responsiveness in a more complicated way than is usually supposed. In particular, even simple models show that the much-disputed interest elasticity of the savings rate is not the crucial parameter. (3) In predicting the quantitative effect of changes in tax rules on the capital stock, both the behavioral responses to incentives and the government's overall budget position must be considered. (4) Actual tax rules in the United States are so full of inconsistencies that the important question may be less what overall rate of tax to levy than what can be done to equalize taxes on economically equivalent activities.

Mervyn King has subjected to closer examination the question of the bearing of tax rules on the efficiency of resource use.[23] In bringing to bear what is known about empirical parameter values, King also stresses the limited importance of the interest elasticity of savings in the determination of the "optimal" tax from an efficiency standpoint and concludes that the efficiency losses of the present system in the United Kingdom (broadly similar to that in the United States) may be large.

Nevertheless, considerable attention continues to be directed to the interest elasticity of savings. Bureau Research Associate Charles McLure undertook to review the empirical literature on this subject.[24] McLure's conclusion: determining the effect interest rates have on saving involves considerable conceptual and econometric difficulties and has not yet been accomplished satisfactorily.

Faculty Research Fellow Don Fullerton has collaborated with Princeton graduate student Charles Becker to assess the effects of various proposals to change the tax treatment of savings.[25] The general equilibrium simulation approach (discussed above) enables them to capture interindustry allocative distortions that arise from inconsistent taxation of capital income. Among their more interesting findings is a sizable efficiency gain from indexing the tax rules for inflation.

The Fullerton-Becker work is in an essentially static but general equilibrium framework. Lawrence Summers carries out a study of the effect of tax policy on corporate demand for investment in a dynamic but partial equilibrium (fixed required aftertax yield on investment) framework.[26] He postulates a relationship between the excess of market value over cost of new investment goods and the rate of accumulation. Summers's parameter estimates imply a substantial responsiveness of investment demand to tax policy variables.

Bureau President Martin Feldstein and Research Associates David Bradford and Alan Auerbach have all been actively involved in research on the design of tax rules both to offset the effects of inflation and to go beyond this to reduce existing tax disincentives bearing on investment.[27] Feldstein has studied the capacity of currently discussed changes in tax depreciation rules to correct for inflation rates experienced recently. His conclusion: In spite of apparently ad hoc appearances, they would not do badly.

In a series of papers, Auerbach and Bradford have laid out the theoretical and practical issues involved in designing rules that will both offset inflation and generate efficient allocation of investment resources.[28] They stress two shortcomings of most currently discussed methods for adjusting depreciation deductions. First, because they continue to rely on historical cost as the basis for a series of deductions through time, they leave the tax system vulnerable to changes in the inflation rate. Depreciation allowances that are "just right" at a given rate of inflation will be too rapid with a lower rate of inflation. Second, because they do not correctly calibrate the tax incentive to the asset's lifetime, they will also induce inefficent allocation of investment dollars at lower or higher inflation rates.

Bradford's analysis of savings and investment incentives divides them into "consumption tax" rules and "direct grant" rules. The former involve devices such as accelerated depreciation that are implemented by deduction from income, while the investment credit illustrates the latter approach. Bradford shows the difference in the approaches and emphasizes again the need for consistency of approach in order to avoid unnecessary distortions in resource use and wasteful tax-avoiding behavior.

## Conclusions

The summaries presented here give some flavor for the variety in extensive research that has been going on in the Bureau's tax program. Not everything has been covered; neither have some of the new developments been discussed. It is clear, though, that the Bureau's tax researchers have a sufficient number of problems worthy of their attention in the coming months and years.

[22] *D. Bradford, "The Economics of Tax Policy toward Savings," NBER Reprint No. 141, 1980.*

[23] *M. King, "Savings and Taxation," NBER Working Paper No. 428, January 1980.*

[24] *C. McLure, Jr., "Taxes, Saving, and Welfare: Theory and Evidence," NBER Working Paper No. 504, July 1980.*

[25] *C. Becker and D. Fullerton, "Income Tax Incentives to Promote Saving," NBER Working Paper No. 487, June 1980.*

[26] *L. Summers, "Tax Policy and Corporate Investment," NBER Working Paper No. 605, December 1980.*

[27] *M. Feldstein, "Adjusting Depreciation in an Inflationary Economy: Indexing versus Acceleration," NBER Working Paper No. 395, October 1979; A. Auerbach, "Tax Neutrality and the Social Discount Rate: A Suggested Framework," NBER Working Paper No. 457, February 1980; A. Auerbach, "A Note on the Efficient Design of Investment Incentives," NBER Working Paper No. 483, June 1980; D. Bradford, "Issues in the Design of Saving and Investment Incentives," NBER Working Paper No. 637, February 1981.*

[28] *A. Auerbach, "Tax Neutrality and the Social Discount Rate,"* op. cit.; *A. Auerbach, "A Note on the Efficient Design of Investment Incentives,"* op. cit.; *A. Auerbach, "Inflation, and the Tax Treatment of Firm Behavior," NBER Working Paper No. 547, September 1980; D. Bradford, "Issues in the Design of Saving and Investment Incentives,"* op. cit.

# Inflation, Taxation, and the Market for Capital

by Lawrence H. Summers

The last decade has witnessed important changes in the valuation and accumulation of capital in the United States. Despite economic growth, the real value of the stock market has declined by 45 percent since 1965. Measured in 1981 dollars, the Dow Jones average stood at 2000 in 1967. This sharp decline in the real valuation of corporate capital has been mirrored by the rapid appreciation in the value of other capital assets. The price of owner-occupied housing has risen by 34 percent relative to other consumer goods since 1970. These changes in the pricing of existing capital goods have had important effects on patterns of capital accumulation. The growth rate of fixed capital per worker in private business slowed from 3.0 percent in the 1949–74 period to -0.1 percent in the 1975–79 period. At the same time the growth rate in the real value of the owner-occupied housing stock increased from 2.7 percent in the 1960s to 5.3 percent in the 1970s.

These changes in the valuation and accumulation of capital have a variety of important effects. Millions of Americans have been disappointed by the real losses they have suffered on their stock market holdings during the 1970s. Others have been delighted by windfall gains on their homes. The resulting changes in the composition of wealth have been substantial. The value of the stock market exceeded that of owner-occupied housing by 30 percent in 1965 but was actually less than the value of the housing stock by 1980. Perhaps more important than these wealth transfers are the effects of the slowdown in capital accumulation. By most estimates a significant part of the continual productivity slowdown can be attributed to the declining rate of growth of the capital stock. Plausible estimates suggest that if capital accumulation had continued throughout the 1970s at its earlier pace, GNP today would be higher by $50 billion, or almost $1000 per family.

It is important to seek an explanation for these developments. The drastic revaluations of capital assets described here have coincided with the upsurge in the rate of inflation that we have experienced in the last fifteen years. A central theme of my research has been elucidation of the links between inflation and patterns of capital accumulation and valuation. Simplified textbook models predict that inflation should not have important effects on capital valuation or accumulation. These models neglect an important feature of reality—a tax system that taxes nominal rather than real income. The research described here is directed at showing how tax factors help to explain important aspects of the recent experience.[1]

The first step in examining the importance of interactions between inflation and taxation is measuring their quantitative importance. In research with NBER President Martin Feldstein, an attempt was made to evaluate the impact of inflation on the taxation of corporate capital income.[2]

We showed that inflation affects the taxes levied on corporations in three main ways. First, firms are permitted to deduct depreciation allowances evaluated only at historic costs, rather than at replacement cost. This raised corporate tax liabilities by $19.1 billion in 1977. Second, many firms choose to use FIFO accounting, leading to phantom inventory profits. These illusory profits led to $7 billion in extra tax payments in 1977. These two effects are partially offset by a third: the deductibility of nominal interest payments that saved firms just over $15 billion in 1977. The net increase of $11 billion represented almost a 25 percent increase in corporate tax payments due to the taxation of nominal rather than real income.

However, in order to assess the importance of the effects of inflation fully, it is necessary to consider the effect of inflation on personal as well as corporate tax levies. When this is done, the effects of inflation become much more pronounced. The gains corporations realize because of the deductibility of nominal interest are fully offset by the extra taxes that bondholders must pay. In addition, inflation raises individual tax liabilities because nominal rather than real capital gains are taxed. Taking account of these effects, Feldstein and I found that in 1977 inflation raised total tax payments by $32.3 billion, or about 50 percent of their no-inflation level.

This study also documented the dramatic increases in the taxation of corporate capital income that have been brought about by inflation. The effective federal tax rate on corporate capital income rose from 52 percent in 1964 to 66 percent in 1977. This occurred despite increases in the investment tax credit and liberalization of depreciation allowances. Available evidence suggests that inflation has further increased effective tax rates since 1977.

The quantitative importance of the effects of inflation on the taxation of corporate capital income suggests that increases in taxes due to inflation may help to explain recent declines in investment and the stock market. In a recently completed study, I examined this possibility.[3] The study analyzes the effects of tax policy on capital accumulation and valuation using an approach based on James Tobin's $q$ theory of investment. As Tobin has explained, aggregate investment can be expected to depend in a stable way on the $q$ ratio of the stock market valuation of existing capital to its replacement cost. In-

[1] *This research has been carried on in tandem with other NBER investigations of the effects of inflation on capital formation. For summaries of some of this work, see "Program Report: Capital Formation,"* NBER Reporter, *Summer 1980, p.3*

[2] *M. Feldstein and L. Summers "Inflation and the Taxation of Capital Income in the Corporate Sector," NBER Working Paper No. 312, and* National Tax Journal, *December 1979.*

[3] *L. Summers, "Inflation, Taxation, and Corporate Investment: A Q Theory Approach," NBER Working Paper No. 604, December 1980.*

creases in the aftertax rate of return on capital will raise the market value of existing capital, causing increased investment. The magnitude of the change in investment arising from a change in tax policy or inflation can be gauged by first calculating its impact on future profits, then discounting these changes to find its effects on stock market valuation, and then using a $q$ investment equation to link this change to investment behavior. This approach is superior to conventional econometric procedures for evaluating investment incentives because it is able to provide estimates of policy announcement effects and to examine tax effects that work through the personal tax system.

The calculations in the paper demonstrate the potential importance of inflation. The estimates suggest that a sudden increase in the rate of inflation from zero to 8 percent would reduce the value of the stock market by 15.1 percent and the rate of investment by 10.2 percent. The effects increase with time. The long-run impact of 8 percent inflation is to reduce the capital stock by 27.8 percent below its no-inflation level, and the value of the stock market by 29.1 percent. The results suggest that the process of adjustment is quite slow, with only half the change in the capital stock coming within twenty years.

The study goes on to examine the effects of alternative methods of partially indexing the tax system. The results show the relative importance of the various nonneutralities caused by the taxation of nominal rather than real income. If depreciation allowances and inventories were indexed, so that they were unaffected by inflation, an 8 percent increase in the rate of inflation would actually raise the value of the stock market by 19 percent in the long run, and investment by 27 percent. This would occur because of the gain corporations would realize on their outstanding indebtedness. If the system were fully indexed at the corporate level, but not the personal level, 8 percent inflation would reduce both the value of the stock market and investment by 11 percent in the long run. This is due to the taxation of nominal capital gains under the personal income tax.

In a related study, carried out with Michael Salinger, I used a similar framework to examine the impact of inflation on the stock market valuation and investment decisions of individual firms.[4] The results were broadly consistent with the earlier aggregate analysis. They did, however, suggest that inflation is likely to have important effects on the composition of investments, given present tax treatment. Firms with short-lived capital, few inventories,and substantial leverage find that their investment incentives increase with inflation, while firms with long-lived capital, large inventories, and little debt are hurt by inflation.

This analysis presumes that investors are rational and perceive these tax effects. This assumption should at least be questioned. Economists have only recently isolated the important interactions of inflation and taxation and their likely impacts. Is it reasonable to suppose that the general public has always understood these factors and invested accordingly? I have examined this question using cross-section time-series data on a sample of 1000 firms drawn from the Compustat tapes.[5] The results of the empirical analysis suggest that, as theory would predict, unexpected inflation reduces the relative market value of firms that use FIFO inventory accounting and raises the relative market value of leveraged firms. However, contrary to the implications of the theory, inflation does not appear to badly hurt firms whose tax liabilities are most affected by historic cost depreciation. This is an important anomaly, since historic cost depreciation is the largest of the factors through which inflation raises real tax rates. The data do indicate, though, that the adverse effect of inflation on these firms has increased in recent years. This suggests that the market is increasingly seeing through the effects of inflation and looking at real profitability. This growing awareness of the illusory quality of reported earnings may help to account for the poor performance of the stock market during the 1970s.

So far, this discussion has focused entirely on the effects of corporate capital income taxation on the corporate sector. However, the interaction of inflation and taxation has important implications for other asset markets as well. Inflation makes corporate capital less attractive, reducing its market value. The extra tax burden on corporate capital increases the price of other assets as individuals try to reallocate their portfolios. I have shown that the interaction of inflation and taxation could account for much of the increase in housing prices that has been observed in recent years.[6] Empirical research bears out the tendency for unexpected inflation to benefit owner-occupied housing. As James Poterba has suggested, this effect is enhanced by the ability of homeowners to deduct nominal rather than real interest payments for tax purposes.[7]

An additional implication of models with inflation and taxes is that inflation should increase nominal interest rates more than point for point. This is because real aftertax interest rates should remain approximately constant. Empirical research does not bear out this prediction.[8] Interest rates over the past 120 years have consistently failed to incorporate inflation premiums fully. Perhaps their failure to rise more than point for point with inflation in the presence of taxes is less surprising given their failure to rise at all in the period before taxes were important. However, the anomalous behavior of interest rates remains an important item on the agenda for future research on interaction between inflation and taxes.

[4] *L. Summers and M. Salinger, "Tax Reform and Corporate Investment: A Microeconometric Approach," forthcoming as an NBER Working Paper.*

[5] *L. Summers, "Inflation and the Valuation of Corporate Equities," forthcoming as an NBER Working Paper.*

[6] *L. Summers, "Inflation, the Stock Market, and Owner-Occupied Housing," NBER Working Paper No. 606, December 1980, and* American Economic Review, *May 1981.*

[7] *J. Poterba, "Inflation, Income Taxes, and Owner-Occupied Housing," NBER Working Paper No. 553, September 1980.*

[8] *L. Summers, "The Nonadjustment of Nominal Interest Rates: A Study of the Fisher Effect," forthcoming as an NBER Working Paper.*

# The Importance of Company Service at U.S. Workplaces

James L. Medoff and Katharine G. Abraham

Everyone knows that employees with more years of service at a company normally receive higher pay than comparable employees who have spent less time with the same firm. Within the economics profession, the conventional wisdom of the 1960s and 1970s has been that the observed higher relative earnings of employees with longer service reflect greater accumulation of human capital through on-the-job training and thus higher relative productivity.[1] There are, however, numerous other plausible explanations for the higher relative earnings of employees with longer service in which relative productivity plays a much less significant role. For instance, Jacob Mincer recognized the possibility that the positive association between job tenure and earnings might only "reflect the prevalence of institutional arrangements such as seniority provisions in employment practices." He then implicitly describes one approach to testing the human capital belief: "Such practices, however, do not contradict the productivity-augmenting hypothesis, unless it can be shown that growth of earnings under seniority provisions is largely independent of productivity growth."[2]

Although the test required to establish empirically the superiority of the human capital explanation of the company service-earnings profile over alternative models in which other factors determine earnings growth seems straightforward, no one has ever provided evidence demonstrating that tenure-earnings differentials *can* in fact be explained by tenure-productivity differentials. As a result, important beliefs about earnings differentials and related labor market phenomena have been held without any empirical foundation.

Our work has produced very strong evidence that at least the within-grade or within-job fraction of the observed return to years of company service (40 to 80 percent of the total return to company service in the settings for which we have seen data) cannot be explained on the basis of an underlying relationship between service and productivity. Furthermore, we have collected survey data that imply that years of service play a significant role in promotion decisions for roughly 50 percent of our country's workforce; for those employees, the cross-grade or cross-job earnings differential associated with service must also be considered at least in part a return to service per se. It would thus appear that junior workers are typically paid less, and senior workers more, than the value of their marginal product. One might expect this sort of deferred compensation scheme to be accompanied by constraints on firms' ability to cheat workers out of the return promised for the "second half" of their worklives; we have gathered evidence that senior employees at most U.S. firms do in fact enjoy substantial protection against being involuntarily terminated. Our results raise the intriguing question of *why* senior workers receive higher earnings than their junior peers, even though they are no more productive.

The remainder of this summary discusses how the facts just stated were discovered and the necessity for the collection of additional facts if we are to hold empirically based beliefs about why service per se plays such an important role in private sector U.S. enterprises.

## The Facts on Service-Earnings Differentials within Grades or Jobs

To determine whether service-earnings differentials can be explained by service-productivity differentials, it is necessary to search for measures of individuals' relative contributions to their firms. We looked first at the computerized personnel files for exempt (roughly, managerial and professional) employees of four major U.S. corporations; each file had information on individuals' job performance, company service, and earnings. At three of these companies the performance ratings were done by the employee's immediate supervisor; at the fourth, in addition to the immediate supervisor's rating, there was a ranking of each employee relative to others in an appropriate comparison group. Later, Peter Halasz of Harvard University gained access to a comparable data set for a sample of nonexempt salaried employees.[3]

Under all of the companies' evaluation procedures, supervisors are instructed to base their rating or ranking on how well an individual, in the year of evaluation, is carrying out the responsibilities of his or her job. Thus, a performance review should reflect an employee's current level of performance relative to the level of performance deemed normal for someone in his or her position. It follows that the relative contributions of employees can be assessed from their performance ratings only if the employees hold similar jobs.

For compensation purposes, most companies assess the relative importance and difficulty of their myriad exempt and nonexempt salaried positions and group them into grade levels. Thus, it seems reasonable to assume that *within* a grade level, a higher performance rating implies higher productivity. It is for this reason that we, and Halasz, were forced to look within grades in doing our analysis of the determinants of service-earnings differentials. Fortunately, however, the portion of the total

[1] *The human capital model of investment in on-the-job training is laid out in detail in Gary S. Becker,* Human Capital: A Theoretical and Empirical Analysis with Special References to Education *(New York: NBER, 1964), 13-37.*

[2] *Jacob Mincer,* Schooling, Experience, and Earnings *(New York, NBER), 12. Mincer has in mind seniority provisions under collective bargaining agreements when he makes this statement, but his logic applies equally well in other institutional settings.*

[3] *The relative studies are discussed in J. L. Medoff, "The Earnings Function: A Glimpse inside the Black Box," NBER Working Paper No. 224, December 1977; J. L. Medoff and K. G. Abraham, "Experience, Performance, and Earnings,"* Quarterly Journal of Economics, *December 1980, 703-736; J. L. Medoff and K. G. Abraham, "Are Those Paid More Really More Productive?: The Case of Experience,"* Journal of Human Resources, *Spring 1981, 186-216; and Peter Halasz, "What Lies behind the Slope of the Age-Earnings Profile?," Senior Honors Thesis, Department of Economics, Harvard University, Cambridge, Massachusetts: March 1980.*

return to years of service occurring within grade was between 40 and 50 percent of the total differential for our four samples of white, male, exempt employees and 50 percent for Halasz's sample of nonexempt salaried employees.

The key finding of these analyses was that *none* of the substantial, within-grade, service-earnings differentials could be explained by a within-grade, service-performance differential. Contrary to what would be expected under the on-the-job training model, while greater service moved employees toward the upper tail of the earnings distribution for their grade level, it did *not* move them toward the upper tail of the relevant performance distribution. Once employees are assigned to grades, the salary advantage that accrues with company service appears to be automatic, and, hence, independent of productivity.

This result has been challenged on two grounds. First, it has been charged that the estimated service-performance differential is biased downward since a negative partial correlation between years of service and unobserved quality was induced by the necessity of looking only within grade levels. (This bias would be brought about by a promotion system under which merit at least sometimes prevails over seniority, so that longer service within grade implies more times passed over for promotions.) Second, it has been claimed that performance ratings, even for samples of white males, are not valid indicators of relative productivity.

It is likely that there is a negative within-grade correlation between service and ability (largest in absolute value for exempt employees and smallest in absolute value for unionized hourly workers) and hence that the estimated within-grade effect of service on performance is biased downward. It should not be forgotten, however, that the estimated within-grade effect of service on earnings is *also* biased downward. The goal of the analyses of employees' positions in the relevant performance and salary distributions was *not* to derive consistent estimates of the effect of service on either performance or salary. Rather, they were intended to yield an answer to the question: Within grade levels, can performance explain the 40 to 50 percent of the total earnings advantage enjoyed by longer-service salaried employees at the firms we have studied? Our answer of "no" does *not* depend on the consistency of the estimate of the impact of service on performance or on earnings. All that the response depends on is that the *difference* between these two estimated service effects (which have been made comparable through the construction of the performance and earnings categories used in the models estimated) be a consistent estimate of the difference between the two "true" service effects. We know of no reason why it should not be.

In our articles on the issue at hand, we go to great lengths to address the most likely criticisms of subjective performance ratings. In light of what we have been able to learn from our review of the relevant personnel literature, from the case studies we have done, and from various analyses with company personnel data, we feel very comfortable in assuming that performance ratings are good indicators of employees' relative productivity in the year of evaluation. Hence, we believe that this diverse evidence strongly supports the interpretation that we have given to our results concerning the ability of rated performance to explain the within-grade return to years of service.

Further support for this conclusion can be derived from a recent econometric case study done by Yanker, in which an "objective" productivity measure is used to conduct an analysis like the ones just discussed, and from fourteen other studies relating some objective index of productive value to tenure or age in various settings.[4] The Yanker study examined productivity and earnings data for approximately 400 blue collar employees at a unionized manufacturing plant. The productivity measure used was equal to the time a worker took to do his or her job divided by the standard time for performing the job. The study found that none of the within-job service-earnings differential (80 percent of the total differential) could be explained on the basis of more senior workers having higher productivity.

The fourteen other relevant studies examined employees within disparate occupations, such as: production workers (in the wooden household furniture, footwear, and apparel industries), scientists, engineers, teachers, mail sorters, and office workers. These analyses used various objective measures of productive value such as: furniture, shoes, or apparel produced; publications; patents; students' standardized test scores; mail sorted; pages typed; items filed; or cards punched. This research provides support for the proposition that, beyond a typically short orientation period, those who have greater than average service typically perform no better or less well than those with similar assignments who have less than average service. When considered together with the evidence from various sources that wages have a strong positive relationship with tenure within occupational group, these investigations strongly imply that more (less) senior employees are generally paid more (less) than the value of their marginal product. Thus, extant evidence on service-productivity differentials seems to have the same implication about the role of productivity in explaining within-grade or within-job service-earnings differentials whether the index of relative productive value is based on an "objective" measure or on a "subjective" performance rating.

## The Facts on the Role of Service per se in Promotion Decisions

To determine whether the 20 to 60 percent of the monetary return to years of company service that occurs across grades can be explained in terms of a service-productivity differential, it is necessary to understand

[4] *Yanker's results are discussed in Robert H. Yanker, Jr., "Productivity versus Seniority: What Is the Determining Factor in Regard to Wages and Promotion?," Senior Honors Thesis, Department of Economics, Harvard University, Cambridge, Massachusetts: March 1980. Summaries of and references for the other fourteen studies are reported in J. L. Medoff and K. G. Abraham, "Involuntary Terminations under Explicit and Implicit Employment Contracts," NBER Working Paper No. 634, January 1981.*

the role of service independent of productivity in promotion decisions. To take a step in this direction, we surveyed a sample of 884 Standard and Poor's companies about, among other things, the conditions under which a junior employee would be promoted ahead of a senior coworker who was not as good a performer.[5] The question asked was:

> In actual practice, would one of the junior employees in the [largest group of employees who are affected by your decisions concerning the management of human resources] ever be promoted instead of a more senior employee who wanted the job?
>
> [ ] Yes, if the junior employee was considered a better performer than the senior employee.
>
> [ ] Yes, if the junior employee was considered a significantly better performer than the senior employee.
>
> [ ] No, never.

The 377 responses to this query lead us to estimate that 62 percent of private sector, nonagricultural, nonconstruction, unionized, hourly employees work in settings where senior employees are favored substantially when promotion decisions are made; for nonunion hourly employees, the comparable estimate is 56 percent; and for salaried employees, 40 percent. Overall we estimate that approximately 50 percent of our country's private sector, nonagricultural, nonconstruction employees work in settings where senior employees are favored substantially in the promotion process. Hence, for this half of the U.S. workforce, it appears that the piece of the total monetary return to seniority that can be linked to senior employees who have been promoted to better-paying jobs than are held by otherwise comparable junior employees is to a significant extent a reward to seniority per se, rather than simply a reward for higher productivity. Moreover, it should be noted that the 50 percent figure estimates the percentage of the workforce employed where senior employees seem to be favored *substantially* in promotion choices; the percentage working where senior employees are favored *at all* is likely to be much greater. This is because in many settings senior employees can be expected to have a significantly higher probability of being promoted than their junior colleagues when the comparisons are limited to those with the same productivity.

Hence, it appears that 50 percent or less of the private sector employment in the United States is found in settings where the sole monetary return to seniority per se is the substantial premium that occurs within grade level or job category; the other half or more of our country's workforce appears to be found where the earnings advantage associated with seniority independent of productivity occurs both as a result of the assignments given to employees and as a result of the way they are paid for doing a given task.

## The Facts on the Role of Service per se in Termination Decisions

We would expect that the compensation scheme found at most U.S. workplaces would go hand-in-hand with a provision designed to protect workers from being cheated out of the return promised for the "second half" of their worklives. To determine the extent to which protection of this nature conditioned firms' decision making about which employees to terminate when some could not be retained, we asked the following question to the Standard and Poor's sample mentioned above:[6]

> In the event of a reduction in the workforce, would one of the senior employees in the [largest group of employees who are affected by your decisions concerning the management of human resources] ever be voluntarily terminated, that is, laid off permanently against his or her will in place of a junior employee?
>
> [ ] Yes, if the junior employee was considered a better performer than the senior employee.
>
> [ ] Yes, if the junior employee was considered a significantly better performer than the senior employee.
>
> [ ] No, never.

The logic behind this question was as follows: Since senior employees will most likely be paid more than their junior coworkers, the "significantly better" and "no, never" responses would be consistent with the statement that the firm can be expected to incur significant short-run costs to protect its senior workers' claims to their earnings.

Based on the answers from the 163 survey respondents who had witnessed involuntary terminations, we estimate that approximately 73 percent of U.S. private sector, nonagricultural, nonconstruction employees work in settings where senior employees do in fact enjoy substantially greater protection against job loss than junior employees doing similar work. Importantly, there appear to be substantial differences between union and nonunion settings in this regard. Rules protecting senior workers against being permanently laid off before their junior coworkers appear to be more prevalent and stronger under trade unions. For hourly employees, 95 percent of the responses pertaining to groups covered by collective bargaining implied that seniority in and of itself receives substantial weight in termination decisions, while only 70 percent of the responses pertaining to noncovered groups indicated that this is the case. As for "strength," while 68 percent of our survey responses that pertained to unionized hourly employees indicated that a senior worker would *never* be involuntarily terminated before a junior worker, the same was true for only 28 percent of the responses pertaining to nonunion hourly employees.

## The Facts to Be Collected

An explanation of why senior workers doing a given job in U.S. corporations receive higher salaries than their

[5] *Our findings on promotions are discussed in J. L. Medoff and K. G. Abraham, "Years of Service and Probability of Promotion," mimeographed, November 1980, and in J. L. Medoff and K. G. Abraham, "The Role of Seniority at U.S. Workplaces: A Report on Some New Evidence," NBER Working Paper No. 618, January 1981.*

[6] *Our work on terminations is discussed in J. L. Medoff and K. G. Abraham, "Involuntary Terminations under Explicit and Implicit Employment Contracts," op. cit., and in J. L. Medoff and K. G. Abraham, "The Role of Seniority at U.S. Workplaces," op. cit.*

junior, but no less valuable, coworkers remains to be documented. At present, there are a number of theories that might be considered consistent with our findings. One group of potential explanations revolves around the notion that employers and employees may enter into implicit contracts that provide that earnings be deferred toward the end of the worklife. Firms may offer such contracts (1) to deter quits, or behavior that would lead to discharge[7]; (2) to discourage workers with high propensities to quit from seeking employment with the firm[8]; (3) to improve morale by giving employees regular raises; and (4) to insure relatively risk-averse employees against slow earnings growth that might otherwise be associated with slow productivity growth.[9] A second type of explanation might be that such contracts avoid the unpleasantness felt by a supervisor who has to fire or reduce the relative salary of a longtime subordinate. A third issue that deserves mention is that societal beliefs—for example, the idea that elders should be respected—may condition employees' beliefs concerning "just" relative compensation. Unfortunately, at this point, all of these theories suffer the same deficiency as the human capital theory about the service-earnings profile: absence of an empirical basis.

Some of these theories might in principle be tested econometrically with cross-sectional data. There is, however, one important problem with this approach: the variables related to the slope of the service-earnings profile most likely both partially determine the profile's slope and are partially determined by it. For example, a steeper earnings profile may deter quits, but the quit rate in a particular setting may also influence the slope of the earnings profile. Thus, the probability of rather severe simultaneous equations bias with a cross-section seems large. Moreover, it is not at all obvious, at least to us, that valid instruments can easily be obtained to deal legitimately with this form of bias.

For this reason, we would argue that any cross-sectional results must be supplemented by well-thought-out longitudinal analyses and by new survey evidence drawn from those who administer and those who are affected by corporate compensation policies. Conducting such investigations would represent an important step toward an *empirically based* interpretation of service-earnings differentials in particular and earnings differentials in general.

[7] *For development of a model along these lines, see Gary S. Becker and George J. Stigler, "Law Enforcement, Malfeasance, and Compensation of Enforcers,"* Journal of Legal Studies, *1974, 1-18, and Edward P. Lazear, "Why Is There Mandatory Retirement?"* Journal of Political Economy, *December 1971, 1261-1284.*

[8] *See Joanne Salop and Steven Salop, "Self-Selection and Turnover in the Labor Market,"* Quarterly Journal of Economics, *November 1976, 619-627.*

[9] *A model with much of this flavor has been set out by Milton Harris and Bengt Holmstrom, "Ability, Performance, and Wage Dynamics," J. L. Kellogg School of Management, Discussion Paper No. 469, Northwestern University, April 1981.*

# Economic Outlook Survey

## Second Quarter 1981

Victor Zarnowitz

According to the median forecast from the latest survey of professional economic forecasters taken by the American Statistical Association and NBER, inflation will average somewhat less than 9 percent in the year ahead, total output of goods and services will grow about 3 percent, and the overall unemployment will persist at rates exceeding 7 percent of the labor force.

### Inflation Forecasts Lower

Three months ago, the forecasters expected an annual inflation rate of 9.7 percent for the GNP implicit price index in the current (1981:2) quarter; in the present survey, the corresponding figure is 8.1 percent. For the four quarters through 1982:1, the average inflation rate now expected is 8.6 percent, as compared with 9.1 percent forecast in February 1981. These are significantly lower rates than those experienced in the past year. However, the projected decline in inflation is slow and irregular. For the year 1981 as a whole, the average standing of the index (1972 = 100), estimated at 194.1, is 9.4 percent up from 1980. The projection for 1982:2 is 208.7, which is 8.8 percent above the 1981:2 level.

The outlook for inflation is closely related to the assumptions of restrictive monetary policy and stable energy prices, as reported below.

### Moderate Growth to Follow a Pause in the Current Quarter

Real GNP in 1981:I was underestimated about 1.5 percent and industrial production 1.2 percent in the February survey. To compensate for these errors, the present projections raise the levels of these variables by an average of approximately 1.1 percent for 1981:2–1982:1. However, the expected patterns of change appear to be largely unaffected by these upward level revisions. The unexpected strength of the economy early this year is seen as short-lived.

GNP in 1972 dollars will show virtually no growth in 1981:2, according to the average forecasts from the May survey. The increases in the four successive quarters 1981:3–1982:2 are projected to be moderate at annual rates of 2.0, 3.2, 4.2, and 2.7 percent. The gain for the year 1981 as a whole will be a modest 2.8 percent, that for the period 1981:2–1982:2 only slightly better (3.0 percent).

Industrial production, too, will temporarily stagnate in the current quarter, if these forecasts prove correct. Its annual rates of growth in the four quarters of the year ahead will be 3.5, 7.2, 6.6, and 6.5 percent. The year-to-year gain in 1980–81 is predicted to be 4.2 percent, the advance in 1981:2–1982:2, 5.9 percent.

**Projections of GNP and Other Economic Indicators, 1981-82**

| | Annual | | | Quarterly | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 1981 | | | 1982 | | Percent Change | |
| | 1980 Actual | 1981 Forecast | Percent Change 1980 to 1981 | 1981 Q1 Actual | Q2 | Q3 | Q4 Forecast | Q1 | Q2 | Q1 81 to Q1 82 | Q2 81 to Q2 82 |
| 1. Gross national product ($ bil.) | 2626.1 | 2885.4 | 9.9 | 2853.8 | 2905.6 | 2979.5 | 3072.5 | 3165.5 | 3263.0 | 10.9 | 12.3 |
| 2. GNP implicit price deflator (1972 = 100) | 177.4 | 194.1 | 9.4 | 188.3 | 191.9 | 195.9 | 200.3 | 204.3 | 208.7 | 8.5 | 8.8 |
| 3. GNP in constant dollars (bil. 1972$) | 1480.7 | 1522.2 | 2.8 | 1516.0 | 1515.3 | 1522.7 | 1534.9 | 1550.7 | 1561.1 | 2.3 | 3.0 |
| 4. Unemployment rate (percent) | 7.1 | 7.38 | 0.28[1] | 7.33 | 7.4 | 7.5 | 7.3 | 7.2 | 7.1 | -0.13[1] | -0.3[1] |
| 5. Corporate profits after taxes ($ bil.) | 163.1 | 168.0 | 3.0 | 168.3 | 165.0 | 164.5 | 174.0 | 174.5 | 180.0 | 3.7 | 9.1 |
| 6. Plant and equipment expenditures ($ bil.) | 295.6 | 322.0 | 8.9 | 310.1 | 317.0 | 326.0 | 335.0 | 348.0 | 358.5 | 12.2 | 13.1 |
| 7. New private housing units started (ann. rate mil.) | 1.29 | 1.38 | 7.0 | 1.39 | 1.30 | 1.37 | 1.47 | 1.57 | 1.68 | 12.9 | 29.2 |
| 8. Change in bus. inventories GNP accounts ($ bil.) | -5.9 | 6.3 | 12.2[2] | 2.6 | 5.0 | 7.5 | 10.0 | 15.0 | 16.8 | 12.4[2] | 11.8[2] |

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

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

## Sticky Unemployment at More Than 7 Percent

The predicted growth is insufficient to generate any large decline in unemployment. The median forecasts for the jobless rate vary within a very narrow range in the four quarters of this year, from 7.3 percent in 1981:1 to 7.5 percent in 1981:3, then back again to 7.3 percent in 1981:4. In the first two quarters of 1982, the rate of unemployment is expected to decline slightly, to 7.2 and 7.1 percent. The predicted average for 1981 as a whole is 7.4 percent, up from the 7.1 percent figure recorded for the recession year 1980.

## Business Investment and Profits Relatively Weak

Business expenditures for new plant and equipment will reach $322 billion in 1981, 8.9 percent higher than the year before. This forecast is more optimistic than the 7.5 percent increase expected in February, but it still barely matches the prospective inflation and hence leaves little scope for new capital formation in real terms. However, business fixed investment is seen as growing faster in the year ahead: the annual rate for 1982:2 is $358 billion, about 13 percent higher than in 1981:2.

Corporate profits after taxes will fall slightly in this quarter and the next (from $168 billion annual rate in 1981:1 to $164 billion in 1981:3), then rise in each of the three following quarters to reach $180 billion in 1982:2 (9 percent above the level of 1981:2). This would be a disappointing performance, tantamount to a decline in real terms.

The median forecasts describe a cautious path of advance for business inventory, which is to rise from $5 billion annual rate in the current quarter to $16.8 billion a year hence.

## Some Improvements in Consumer Capital Outlays

An upturn in housing starts is predicted, from 1.3 million units at annual rate in 1981:2 to 1.7 million in 1982:2. Although large in relative terms (29 percent), this increase would still leave the housing industry at a rather low level of activity compared with the recent expansions (e.g., the starts approximated or exceeded 2 million units in each of the five years, 1971-73 and 1977-78).

Consumer expenditures for durable goods will rise to $241 billion in 1981, 13.5 percent above 1980. Their level in 1982:2 is projected at an annual rate of $270 billion, which is more than 15 percent up from 1981:2. These rates of growth exceed considerably their counterparts for GNP and the implicit price deflator, suggesting substantial increases in real terms.

## The Dispersion of Individual Forecasts

For some variables, the distributions of the individual predictions are so tight and symmetrical that the averages are quite representative. This is so particularly for the implicit price deflator but also, to a somewhat lesser degree, for nominal GNP and the unemployment rate. For other variables, the dispersion of the individual predictions is much greater, especially for the longer forecast spans (more distant quarters), and the distributions are often skewed to the right, that is, toward the larger values. This is notably so for profits, business fixed investment, consumer durables, and national defense purchases.

### Chances of Another Recession

These are similar to the probabilities reported three months ago: relatively low and declining rapidly. For example, the medians of the estimated probabilities of decline in real GNP are 35, 20, 10, 10, and 5 chances in 100 for the five successive quarters from 1981:2 through 1982:2, respectively.

### Major Assumptions

Most (35) of the forecasters assume personal tax cuts and accelerated depreciation allowance, more or less in line with the Administration's proposals. Large increases in defense spending are expected, to average nearly 17 percent in the year ending at mid-1982. Twenty-two respondents state that monetary policy will continue to be restrictive and interest rates high; nine see "money growth at the high end of the targets" and lower interest rates. Few anticipate large increases in energy prices; those who foresee no new oil shocks and stable energy prices outweigh the pessimists nearly three to one.

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

# NBER Profiles

## David G. Hartman

David G. Hartman, a research associate in NBER's Program in Taxation since 1978, will succeed Charles E. McLure, Jr. with the title of executive director of the Bureau this fall. Hartman was born in Pekin, Illinois, in 1951.

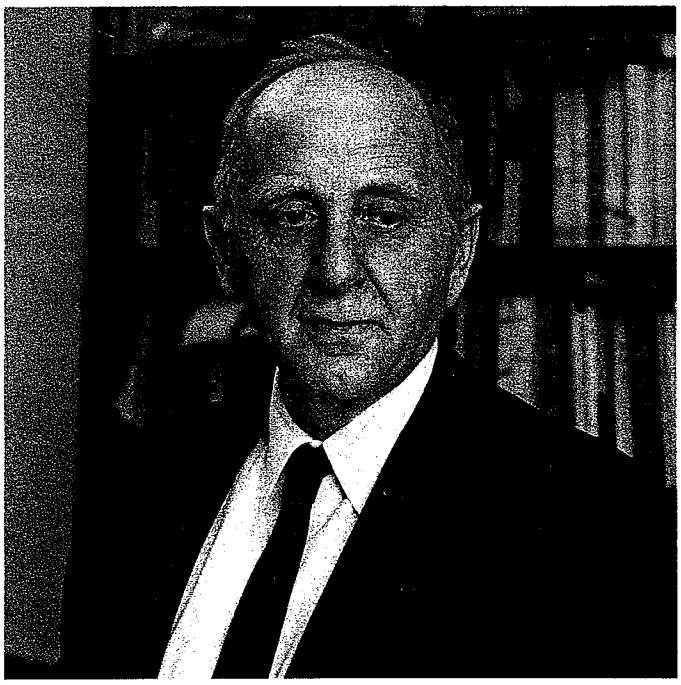
He received a B.A. in economics and mathematics and an M.A. in economics from Northwestern University in 1973 and a Ph.D. in economics from Harvard in 1976.

From 1971–73, Hartman was an economist with the Commodity Exchange Authority. He was a teaching fellow in economics at Harvard from 1974–76 when he was named assistant professor. Between 1976 and 1978, Hartman also served as director of undergraduate economics programs at Harvard. In 1981, Hartman was promoted to associate professor of economics.

Hartman, who is an editor of the *Quarterly Journal of Economics*, has written on the implications of the open economy for tax policy analysis. He has served as a consultant to the U.S. Treasury Department and Data Resources, Inc., and the government of Indonesia. His wife, Patricia, is finance and budget officer for the Harvard Institute for International Development. The Hartmans live in Belmont, MA.

## Simon Kuznets

NBER Research Associate Emeritus Simon Kuznets was born in Kharkov, Russia, in 1901. He came to the United States in 1922 and studied at Columbia University where he received a Ph.D. in economics in 1926.



In 1927, Kuznets joined the NBER staff, on which he served until 1960. He was also a member of the faculties of the University of Pennsylvania, for 24 years, Johns Hopkins University, from 1954–60, and Harvard University from 1960 until his retirement, emeritus, in 1971. Also in that year, Kuznets received the Nobel Prize in Economics for his pioneering quantitative study of modern economic growth.

Kuznets has served as president of the American Economic Association and the American Statistical Associ-

ation (of which he is a fellow). He is also an honorary fellow of the Royal Statistical Society of England and a member of the Royal Swedish Academy of Science, the International Statistical Institute, and the American Philosophical Society.

Kuznets's published works, from his early work on national income to his more recent papers and books on the subject of economic development, are too numerous to list; the NBER is now preparing a complete bibliography in honor of Kuznets's eightieth birthday. Kuznets and his wife, Edith, currently reside in Cambridge, MA.

## Lawrence H. Summers

Faculty Research Fellow Lawrence H. Summers, frequently seen at the Cambridge office well past midnight, has been a member of NBER's Program in Taxation since 1978. Summers received his undergraduate degree from MIT in 1975 and did his graduate work at Harvard. He was named assistant professor by MIT in September 1979, was a visiting assistant professor at Stanford University during the 1980–81 academic year, and will be associate professor at MIT in the fall of 1981.

Summers's research interests lie predominantly in public finance, macroeconomics, and labor economics. In addition to his Bureau affiliation, Summers is a member of the Brookings Institution Panel on Economic Activity. He has also served as a consultant to the U.S. Departments of Labor and Treasury and the National Commission on Social Security. On behalf of the Harvard Institute for International Development, Summers has consulted with the Indonesian government on the subject of petroleum pricing. Summers lives in Cambridge, MA, and enjoys playing tennis and squash in his limited leisure time.

# Conferences

## The Changing Roles of Debt and Equity

About fifty invited guests from the business and financial communities met with NBER researchers on April 2 and 3 in Williamsburg (Virginia) at a conference on "The Changing Roles of Debt and Equity in Financing U.S. Capital Formation." The objective of the conference was to provide an opportunity to report on research and to receive feedback from an audience of financial market practitioners representing investment management firms, insurance companies, commercial banks and investment banking firms, as well as financial officers of corporations in nonfinancial lines of business.

Bureau President Martin Feldstein opened the program, and Debt-Equity Project Director Benjamin Friedman of Harvard University followed with an overview of the project's activities. Three papers were presented on the first day:

Patric Hendershott, Purdue University, "Inflation, Resource Utilization, and Debt and Equity Returns"

Zvi Bodie, Boston University, "Investment Strategy in an Inflationary Environment"

Burton Malkiel, Princeton University, "Risk and Return: A New Look"

Hendershott's paper examines the relationship over the last 50 years among security returns, inflation, and the utilization of financial resources. He observes that prior to the Treasury–Federal Reserve accord in 1951, nominal yields on Treasury bills were reasonably stable while the real bill rate was highly volatile. Since 1952, though, the reverse has been the case: nominal bill rates rising and real rates steady near zero.

Bond coupon rates have also risen with inflation during the last 15 years, but bonds have earned negative real returns. Moreover, Hendershott finds, the relative returns on equities and bonds are affected by the business cycle, with equities performing well around troughs and poorly around peaks.

Bodie asks what investment strategy investors concerned with maintaining real value, or purchasing power, should pursue. Using the efficient portfolio framework that looks at original portfolio yield and risk, he finds that money market instruments and other floating rate debt are the cornerstone of a low inflation risk strategy. Stocks earn a high rate of return, but they correlate negatively with inflation, while the returns on commodity future contracts correlate positively with it. Bonds do not increase the efficiency of the portfolio at all. He concludes that new types of financial instruments—for example, commodity-linked bonds in which the bonds' principal or interest is linked to a commodity price, thus rising as inflation increases—may play an increasingly significant role in the portfolios of the future.

Malkiel feels that no single measure adequately captures the variety of systematic risks in stocks and portfolios. Returns are sensitive to many factors including swings of the market in general, changes in interest and inflation rates, and changes in national income. He believes that the best measure of risk is not the traditional beta, which measures systematic risk only, but rather the dispersion of analysts' forecasts of expected returns, which also incorporates unsystematic risk.

The first day of the conference concluded with a dinner at which Harold Williams, former chairman of the SEC, spoke. Williams's topic was "Capital Formation and Allocation: Why the Process Malfunctions."

On the second day, three more papers were presented:

John H. Ciccolo, Jr., Boston College, "Changing Balance Sheet Relationships In the U.S. Corporate Sector"

Benjamin M. Friedman, Harvard University, "The Role of Debt in Financing U.S. Economic Activity"

Martin Feldstein, Harvard University, "Private Pensions as Corporate Debt"

Ciccolo's paper documents, in charts and tables, the trends in sources and uses of funds, market valuations, and rates of return for a sample of U.S. manufacturing corporations spanning 1926–77. He shows the increasing importance of debt, at the expense of preferred stock, in the capital structure of the average corporation. Moreover, he observes a postwar trend away from internal sources of funds and toward debt financing. The data underlying Ciccolo's study are new series, compiled from original sources as a part of the Bureau's research within the debt-equity project.

Friedman looks at the stability of the debt-to-income ratio in the United States and its implications for capital formation. Total nonfinancial debt has been a relatively stable proportion of GNP since 1921, except for the Depression years and World War II. In the postwar period the debt-to-income relationship has been just as stable as the money-to-income relationship (regardless of how money is measured).

This fact has some significant implications. First, the corporate sector will be able to invest more in plant and equipment only if government or mortgage indebtedness falls as a percentage of GNP or if corporations turn increasingly to equity finance. Second, if the corporate sector increases its indebtedness and government debt decreases, there will be more risk in the economy, and corporations may want to hold more equity.

Feldstein examines the private pension as a form of corporate debt. He analyzes the ways in which pension liabilities are and are not like corporate bonds. He then discusses the advantages to the firm of fully funding pension obligations, why some firms still choose to have unfunded pension obligations, and the effect of these unfunded obligations on equity value. After focusing on the firm level, Feldstein asks how private pensions influence the national rate of saving. He also studies the effect of inflation on private pensions and asks what the future of private pensions will be.

All of the papers presented at the conference will become part of the NBER Working Papers series and will later be published in a conference volume. Availability of these papers will be announced in a future issue of the *NBER Reporter.*

# Inflation and Financial Markets

An NBER conference on "Inflation and Financial Markets," chaired by Research Associate Edward J. Kane of Ohio State University, was held in Cambridge on May 15–16. The following papers were discussed:

Kenneth French and Richard Schwert, University of Rochester, and Richard Ruback, MIT, "Effects of Nominal Contracting on Stock Returns"

Discussants: Levis Kochin, University of Washington, and Michelle White, New York University

Roger H. Gordon, Bell Laboratories and NBER, "Inflation, Taxation, and Corporate Behavior"

Discussants: Patric Hendershott, Purdue University and NBER, and Robert Merton, MIT and NBER

Mark Gertler and Earl Grinols, Cornell University, "Inflation and Perceptions of Security Performance: Econometric Evidence from Stock Market Data"

Discussants: Stanley Kon, New York University, and Fischer Black, MIT and NBER

James A. Wilcox, University of California, Berkeley, "Interest Rates, Expected Inflation, and Supply Shocks—or Why Interest Rates Have Been So Low in the 1970s"

Discussants: Thomas Cargill, University of Nevada, Reno, and Jeremy Siegel, University of Pennsylvania

William A. Barnett, Edward K. Offenbacher, and Paul A. Spindt, Board of Governors of the Federal Reserve System, "Empirical Comparisons of Divisia and Simple Sum Monetary Aggregates"

Discussants: Alan Blinder, Princeton University and NBER, and Raymond Lombra, Pennsylvania State University

Lawrence Summers, MIT and NBER, "The Nonadjustment of Nominal Interest Rates: A Study of the Fisher Effect"

Discussants: Benjamin M. Friedman, Harvard University and NBER, and Myron Scholes, University of Chicago and NBER

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

Discussants: Robert Gordon, Northwestern University and NBER, and Laurence Kantor, Lehigh University

Kenneth J. Singleton, Carnegie-Mellon University, "Real and Nominal Factors in the Cyclical Behavior of Interest Rates, Output, and Money"

Discussants: Robert Shiller, University of Pennsylvania and NBER, and Christopher Sims, University of Minnesota and NBER

In their paper, French, Schwert, and Ruback estimate the effects of unexpected inflation on common stock returns of companies with different short- and long-term monetary positions and different amounts of nominal tax shields. They find no evidence that, between 1947 and 1979, stockholders of net debtor firms benefited more from unexpected inflation than stockholders of net creditor firms.

Gordon's paper asks how, in theory, increased inflation without an indexed tax structure affects corporate investment and financial policy and whether it creates capital gains or losses for equity investors. He concludes that with higher inflation: (1) corporate debt-equity ratios will increase; (2) the rate of investment is stimulated slightly; and (3) the average price of corporate stock is scarcely affected.

By analyzing risk premiums, Gertler and Grinols propose a method for assessing the effect on expected security returns of changes in inflation, interest rates, and the unemployment rate. They also measure the aggregate welfare cost to investors of changes in each of these three focal variables.

Wilcox asks how supply shocks have affected real interest rates. He finds that between 1952 and 1972 exogenous increases in the relative supply of materials drove the real interest rate up by about two percentage points. Since 1972, though, the equilibrium real rate has been driven down more than one percentage point by decreases in the supply of materials.

The paper by Barnett, Offenbacher, and Spindt argues that reliance on a Divisia index would improve on the monetary aggregates now in use. A Divisia index is constructed by weighted aggregation of its components rather than simple summation. The theory predicts that Divisia indexes of money should be more stably related than the conventional monetary aggregates to such measures of national economic performance as unemployment, output, and inflation. The authors perform numerous empirical tests to compare the two types of indexes. Almost all of these tests favor the Divisia method.

In his paper, Summers reexamines the theory and evidence concerning the effect of anticipated inflation on interest rates. He concludes that time-series data do not confirm classical or Keynesian theories. From 1860 to 1940, inflationary expectations had no short-run or long-run effect on interest rates; after World War II, rates were affected, but less than the theory predicted. The strongest relationship between expected inflation and interest rates was observed in 1965–71, which Summers suggests may reflect money illusion.

Makin questions another well-known theory: that only unanticipated money growth affects real economic variables. Contrary to this rational expectations hypothesis, Makin finds that three measures of anticipated money growth show a positive impact on output and employment growth that is not temporary.

Singleton constructs a monthly time series of "real" and "neutral" components of short-term Treasury yields and the growth rate of money. His analysis indicates that: (1) higher and more variable inflation leads to increased variance in real yields on T-bills; (2) short-term real interest rates move procyclically with output; and (3) variations in the growth rate of money are more closely associated with variations in the real index than the neutral one.

Every paper discussed at the conference will become part of either the Bureau's Working Papers or Conference Papers series. A brief nontechnical summary report of the conference will also be available later this year. Information on these publications will appear in future issues of the *NBER Reporter*.

# Conference Calendar

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

Organizations wishing to have meetings listed in the Conference Calendar should send information, comparable to that given below, to Conference Calendar, National Bureau of Economic Research, 1050 Massachusetts Avenue, Cambridge, MA 02138. Please also provide a short (fewer than fifty words) description of the meetings for use in determining whether listings are appropriate for inclusion. The deadline for receipt of material to be included in the Fall issue of the *Reporter* is September 16. If you have any questions about procedures for submitting materials for the calendar, please call Kirsten Foss at (617) 868-3974.

**August 10–13, 1981**
Annual Meeting, American Statistical Association Biometric Society

**August 24–28, 1981**
Applied General Equilibrium Models, NBER

**August 31–September 4, 1981**
European Meeting, The Econometric Society

**September 17–18, 1981**
Panel on Economic Activities, Brookings Institution

**September 23–25, 1981**
Annual Meeting, National Association of Business Economists

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

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

**October 2–4, 1981**
R and D Conference, NBER

**October 3–7, 1981**
Annual Meeting, American Bankers Association

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

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

**October 16-17, 1981**
Program Meeting: Financial Markets, NBER

**October 21, 1981**
International Conflicts and National Policy, Resources of the Future

**October 22-24, 1981**
Annual Research Conference, Public Policy Analysis and Management, Urban Institute

**October 23, 1981**
Program Meeting: Taxation, NBER

**October 29-30, 1981**
Program Meeting: International Studies, NBER

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

**November 10, 1981**
The Effect of the Changing Family Relations on Employee Benefit Programs, Employee Benefit Research Institute

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

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

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

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

**January 7-8, 1982**
Program Meeting: Pensions, NBER

**January 22-23, 1982**
Program Meeting: Financial Markets, NBER

**January 25-29, 1982**
Conference on Exchange Rates, NBER

**February 4-5, 1982**
Issues and the Conduct of Monetary Policy, American Enterprise Institute

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

**March 25-26, 1982**
Financial Aspects of the U.S. Pension System, NBER

**April 1982**
Conference on Economic Fluctuations, NBER

**April 16, 1982**
Program Meeting: Taxation, NBER

**May 1982**
Transfer Payments, NBER (Income and Wealth)

**May 7-8, 1982**
Program Meeting: Financial Markets: NBER

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

**June 28, 1982**
Econometrics and Public Finance, NBER

**August 16-19, 1982**
Annual Meeting, American Statistical Society

**August 25-27, 1982**
Taxation in Federal Systems, International Seminar in Public Economics

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

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

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

**August 15-18, 1983**
Annual Meeting, American Statistical Society

**September 1983**
First Quarter Century of Cliometrics, NBER

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

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

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

**December 28-30, 1984**
Annual Conference, American Economic Association*

**December 28-30, 1985**
Annual Conference, American Economic Association*

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

# Bureau News

## ERRATA

Victor Zarnowitz and Geoffrey H. Moore, "The Timing and the Severity of the Recession of 1980," *NBER Reporter*, Spring 1981, pp. 19-21. The second and third sentences in footnote 4 should read as follows:

*The shortest business cycle expansion in the NBER chronology for the United States lasted ten months (3/1919-1/1920). Incidentally, this expansion was preceded by the shortest contraction of seven months (8/1918-3/1919).*

The heading of column (5) in Table 2 should read: "December 1969-November 1970."

# 1981-82 Research Associates

Alan J. Auerbach
Marcy Avrin
Robert J. Barro
Ann P. Bartel
Ernst R. Berndt
John F. O. Bilson
Fischer Black
Alan S. Blinder
Zvi Bodie
Michael J. Boskin
David F. Bradford
William H. Branson
Charles Brown
Michael Bruno
Willem H. Buiter
Phillip Cagan
Dennis W. Carlton
Gary Chamberlain
John H. Ciccolo, Jr.
Kim B. Clark
Douglas Coate
John G. Cragg
Michael R. Darby
Lance Davis
Rudiger Dornbusch
Ronald Ehrenberg
Stanley L. Engerman
Ray C. Fair
Martin Feldstein
Stanley Fischer
Franklin Fisher
Roderick Floud
Robert W. Fogel
Richard B. Freeman
Jacob A. Frenkel
Benjamin M. Friedman
Victor R. Fuchs
Robert E. Gallman
Arthur E. Gandolfi
Stephen Goldfeld
Claudia Goldin
Fred Goldman
Robert J. Gordon
Roger Hall Gordon
Jerry Green
Zvi Griliches
Reuben Gronau
Herschel I. Grossman
Michael Grossman
Alan L. Gustman
Robert E. Hall
Michael J. Hamburger
Daniel S. Hamermesh
David G. Hartman
Jerry A. Hausman
James J. Heckman
John Helliwell
Patric H. Hendershott
Michael D. Hurd
Robert Inman
John James
Edward J. Kane
James Kearl
Mervyn A. King
Laurence Kotlikoff
Pentti J. Kouri
Irving B. Kravis
Anne O. Krueger
Paul Krugman
Mordecai Kurz
William M. Landes
Edward P. Lazear
Richard M. Levich
Wilbur G. Lewellen
Gregg Lewis
Eugene Lewit
Robert E. Lipsey
James R. Lothian
Robert E. Lucas, Jr.
Thomas E. MaCurdy
John H. Makin
Burton G. Malkiel
Richard C. Marston
Bennett T. McCallum
Charles E. McLure, Jr.
James L. Medoff
Robert C. Merton
Peter Mieszkowski
Jacob Mincer
Frederic S. Mishkin
Michael L. Mussa
Stewart C. Myers
M. Ishaq Nadiri
William D. Nordhaus
Anthony J. Pellechio
John N. Pencavel
James E. Pesando
A. Mitchell Polinsky
William Poole
Clayne L. Pope
Richard Portes
Richard A. Posner
J. David Richardson
Harvey S. Rosen
Sherwin Rosen
Michael Rothschild
David Salkever
Thomas J. Sargent
Gary G. Schlarbaum
Myron S. Scholes
Anna J. Schwartz
Robert A. Shakotko
Steven Shavell
Robert J. Shiller
John B. Shoven
William Silber
Christopher A. Sims
Joseph E. Stiglitz
Robert A. Taggart, Jr.
John Taylor
Paul J. Taubman
Irwin Tepper
W. Kip Viscusi
Michael L. Wachter
Robert J. Willis
Charles A. Wilson
Larry T. Wimmer
David A. Wise
Victor Zarnowitz
Richard J. Zeckhauser

# Hartman to Succeed McLure

Charles E. McLure, Jr., vice president of the National Bureau since 1977, will be leaving that position at the end of August to become a Senior Research Fellow at Stanford University's Hoover Institution. During his four years with NBER, McLure has been responsible for oversight of day-to-day operations. At the Hoover Institution he will continue his research in taxation, including especially incidence analysis, federal tax policy, the taxation of natural resources, and corporate income taxation. He will also continue as an NBER research associate.

David Hartman (see Profiles section of this *Reporter*), currently an NBER research associate and associate professor at Harvard, has been named executive director of the Bureau effective September 1. He will assume McLure's administrative responsibilities while continuing to participate in the taxation and international studies programs of the Bureau.

# Kuznets Honored

Harvard University and the NBER honored Emeritus Research Associate Simon Kuznets (see Profiles section of this *Reporter*) on his eightieth birthday at a party in Cambridge in April. Kuznets's colleagues and students, including two former NBER presidents, Arthur Burns and John Meyer, and current president Martin Feldstein, came to honor Kuznets at a Saturday night dinner and Sunday seminar on April 25 and 26.

In his remarks, Kuznets enumerated a number of "special circumstances" that contributed to his success: first, the strong scientific and statistical training he had received in Russia before coming to the United States in 1922; second, his meeting Wesley Mitchell, one of the Bureau's founders, while getting his Ph.D. at Columbia; third; his three-and-a-half-decade association with the Bureau that began in 1927; and fourth, the explosion of quantitative research in the 1930s and during the war years. Kuznets also remarked that "the availability of specialized research institutions in this country which were rare abroad, and the possibility of combining that with graduate teaching at a university was one almost indispensable condition for the kind of sustained research program that I prefer to follow."

# Productivity Research Discussed

Members of NBER's Program in Productivity and Technical Change met in Cambridge on March 27 to discuss ongoing research. Jacques Mairesse, of l'Ecole Nationale de la Statistique et de l'Administration Economique, and Alan Siu, Harvard University, described their projects, one comparing U.S. and French productivity, and another analyzing how a firm's productivity is affected by R and D.

Next, M. Ishaq Nadiri, New York University, talked about three pieces of research in which he is engaged: (1) the theory of expectations and their influence on firms' variables; (2) the content of expectational information; and (3) the contribution of R and D to productivity. Frank Lichtenberg, NBER, then described the data set on 450 manufacturers that he has been constructing. John Bound and Clint Cummins, Harvard University, followed with a status report on the matching of data from the U.S. Patent Office with R and D data for industrial firms on the Standard & Poor's Compustat.

Ernst Berndt of MIT discussed his project on short-run productivity and cost functions, and John Beggs of Yale University concluded the meeting with a description of his work on the relationship between R and D and certain firm and industry level characteristics.

In addition to the speakers, participants at the program meeting included: Sumath Addanki, Adam Jaffe, and Program Director Zvi Griliches, all of Harvard University; Uri Ben-Zion, Hebrew University; Bronwyn Hall, Stanford University; John Scott, Dartmouth College; Tom Stoker, MIT; and Pankaj Tandon, Boston University.

# Meeting on Labor Studies Held

Four papers were discussed at the most recent meeting of NBER's Program in Labor Studies on May 8:

Edward Lazear, University of Chicago and NBER, "A Competitive Theory of Monopoly Unionism"

Alan Gustman and Thomas Steinmeier, Dartmouth College and NBER, "Partial Retirement and the Analysis of Retirement Behavior"

Robert Hall, Stanford University and NBER, "Internal Labor Markets and Job Turnover"

David Wise, Harvard University and NBER, "Discontinuous Distribution and Missing Persons: The Minimum Wage and Unemployed Youth"

Lazear adopts a micro approach to analyzing union behavior, using workers and firms as the basic units. The goal of his paper is to predict which industries, occupations, and time spans are most characterized by strong unions, and how unions behave under a variety of circumstances.

Gustman and Steinmeier investigate the significance of partial retirement, an important phenomenon previously little considered in analyses of retirement behavior, Social Security, and the like. They find that even in the absence of pension plans or mandatory retirement rules, partial retirement is an important alternative.

In his paper, Hall hypothesizes that the operation of internal labor markets (that is, within firms) with extensive job ladders may well involve substantial turnover. His empirical results confirm this, showing that a firm's "new hires" are generally unrelated to changes in the firm's total employment.

Finally, Wise discussed his work on the minimum wage and youth unemployment. He finds that without a minimum, 4–6 percent more out-of-school young men would be employed. The minimum wage has its largest effect on hourly workers, and the potential increase in employment from a lower minimum wage would be greatest among the younger youths. Moreover, Wise finds that the average wage paid to youths is lower with the minimum than it would be otherwise.

NBER participants in the program meeting included: Kim Clark, David Ellwood, Martin Feldstein, Program Director Richard Freeman, Zvi Griliches, and James Medoff, all of Harvard University; Charles Brown, University of Maryland; James Brown, Princeton University; Gary Chamberlain, University of Wisconsin; Ronald Ehrenberg, Cornell University; Reuben Gronau, Hebrew University; Daniel Hamermesh, Michigan State University; Kip Viscusi, National Commission for Employment Policy; and Frank Lichtenberg. Among the invited guests were: Henry Farber, MIT; Giora Hanoch, Columbia University; Ruth Klinov, New York University; Robert Meyer, Urban Institute; and Jennifer Roback, Yale University.

# Meeting on International Research

NBER's Program in International Studies held a working session in Cambridge on April 28, chaired by Director William Branson of Princeton. Four papers were discussed:

J. David Richardson, University of Wisconsin, "Modern Commercial Policy under Floating Exchange Rates"

Alan Deardorff, University of Michigan, "The General Validity of the Heckscher/Ohlin Theorem"

Jonathan Eaton and Mark Gersovitz, Princeton University, "A Theory of Expropriation and Deviations from Perfect Factor Mobility"

Gene Grossman, Princeton University, "Aspects of Intersectoral Factor Mobility"

Richardson's paper makes three observations on modern commercial policy (i.e., quota-based barriers, administrative guidelines, and rules). First, "income transfers implicit in modern commercial policy are more intricate and less innocuous than those implicit in tariffs, export subsidies, and other tax-subidy schemes." Second, "income transfers implicit in modern commercial policy create an international transfer problem." Finally, Richardson observes, "modern commercial policy can either strengthen or weaken a currency."

Deardorff's paper states and proves generalized versions of the Heckscher/Ohlin Theorem. The model he uses includes many factors, goods, and countries, a general specification of technology, and an allowance for impediments to trade. His analysis first establishes a presumed negative correlation between net exports of trade-embodied factor services and their respective autarky factor prices and, second, a positive three-way covariance among measures of factor abundance, factor intensity, and net commodity trade.

Eaton and Gersovitz develop a theory of capital movements in the presence of potential expropriation. They

find that, in a simple model, the larger the potential penalty the host country faces for expropriation, the greater is the overall welfare. When the foreign investor is a monopolist, this result is reversed.

Grossman's paper investigates the importance of the intersectoral mobility of capital in determining the effects of protection on the rewards to factors of production. Increasing degrees of capital mobility are shown to be beneficial to labor and harmful to capital owners when the protected sector is labor intensive. When the protected sector is capital intensive, the result is reversed. Grossman asks, Are factors of production likely to be intersectorally mobile? Yes, if there is a great deal of economy-wide uncertainty when training decisions are made, and if there are no markets in which workers can insure their human capital.

In addition to the speakers, program members Paul Krugman, MIT, Robert Lipsey, Queens College (City University of New York); Jeffrey Sachs, Harvard University; and Dennis Warner, Michigan State University, participated in the meeting. Also attending were Ronald Findlay, Columbia University, and Steve Magee, University of Texas at Austin.

# Taxation Program Meets

Members of NBER's Program in Taxation and invited guests met in Cambridge on April 30 and May 1 to discuss their recent research. The following papers were presented:

Joseph Stiglitz, Princeton University and NBER, "General Theory of Local Public Goods: Implications for Tax Policy"

Victor Canto, University of Southern California, "Persistent Growth Rate Differences among States in a National Economy with Factor Mobility"

Discussant: John Shoven, Stanford University and NBER

Peter Mieszkowski, University of Houston and NBER, and George Zodrow, Rice University, "Taxation of Industrial Capital in a System of Local Governments"

Discussant: Laurence Kotlikoff, Yale University and NBER

Daniel Rubinfeld, University of Michigan, "Microestimates of Local Public Spending Demand Functions"

Discussant: Harvey Rosen, Princeton University and NBER

Charles McLure, NBER, "State Taxation of Corporate Income"

Discussant: George Carlson, U.S. Treasury

Rubinfeld uses data from a micro survey on demands for public spending to test some well-known theories of public goods. He finds: (1) a positive income elasticity of the demand for public spending; and (2) a high degree of grouping (into communities) according to the demand for public spending.

Canto's paper attempts to explain the persistence of income differentials among states in a national economy with factor mobility. His empirical analysis suggests that individual states' fiscal policies influence their economic performance.

The Mieszkowski-Zodrow paper reexamines the "new view" of the incidence of the property tax. They conclude that the residential portion of the property tax is a benefit tax, borne by the consumers of public service, while the nonresidential property tax includes a nonbenefit component. Overall, they argue that capital is unlikely to bear much of the burden of the property tax.

Stiglitz's works focuses on the fact that fundamental theorems of welfare economics do not extend well to economies with local public goods. After considering a number of examples of such theoretical inconsistencies, Stiglitz concludes, "It is only under very special and unreasonable assumptions that the process of individual choice among communities leads to Pareto optimality."

During the second day of the conference, NBER Research Economist Daniel Feenberg reported on the availability of data on state taxes in NBER's TAXSIM file. Then Charles McLure presented a summary and appraisal of developments over the last twenty years in state taxation of multistate manufacturing and mercantile firms. Last on the program, NBER President Martin Feldstein discussed his work in progress on tax progressivity and local government spending.

Program Director David Bradford of Princeton University chaired the two-day meeting. Also participating in the discussions were NBER program members: Alan Auerbach and David Hartman, Harvard University; Fischer Black, Jerry Hausman, Stewart Myers, and Lawrence Summers, MIT; Daniel Frisch, University of Washington; Don Fullerton, Princeton University; Roger Gordon, Bell Laboratories; Patrick Hess, Ohio State University; Michael Rothschild, University of Wisconsin at Madison; Joel Slemrod, University of Minnesota; and Michelle White, New York University. Harvey Galper of the Advisory Commission on Intergovernmental Relations also attended the program meeting.

# Conference Papers Available

The papers presented at two NBER conferences are now available as part of the Bureau's Conference Paper series. (See previous issues of the *NBER Reporter* for a listing of other available Conference Papers.) They are issued, sometimes including a formal discussion of the paper, so that research findings can be conveyed quickly, even in cases where a conference volume will later be produced. Beginning in 1981, most papers presented at NBER conferences and written by Bureau associates will become part of the Working Paper series rather than the Conference Paper series. Abstracts of these Working Papers appear in this or previous issues of the *Reporter.*

Individual copies of Conference Papers are available free of charge to corporate associates and other supporters of the National Bureau. Others can receive copies by sending $1.50 per copy to: Conference Papers, National Bureau of Economic Research, 1050 Massachusetts Avenue, Cambridge, MA 02138. Prepayment is

required on orders totaling less than $10.00. Please use the following numbers when ordering papers:

**Inflation**
(These papers have been submitted to the University of Chicago Press to be considered for publication in a volume edited by Robert E. Hall.)

CP 103. "The Effect of Inflation on the Private Pension System," by Jeremy I. Bulow

CP 104. "The Disruptive Effect of Inflation on the Organization of Markets," by Dennis W. Carlton

CP 105. "Explorations in the Gold Standard and Related Policies for Stabilizing the Dollar," by Robert E. Hall

CP 106. "U.S. Inflation and the Dollar," by Jacob A. Frenkel

CP 107. "Inflation, Corporate Profits, and the Rate of Return to Capital," by Jeremy I. Bulow and John B. Shoven

CP 108. "Why Stopping Inflation May Be Costly: Evidence from Fourteen Historical Episodes," by Robert J. Gordon

**Import Competition and Adjustment: Theory and Policy**
(These papers have been submitted to the University of Chicago Press to be considered for publication in a volume edited by Jagdish N. Bhagwati.)

CP 109. "Intersectoral Capital Mobility, Wage Stickiness, and the Case for Adjustment Assistance," by J. Peter Neary

CP 110. "Government Policy and the Adjustment Process," by Michael Mussa

CP 111. "Protection, Trade Adjustment Assistance, and Income Distribution," by Peter A. Diamond

CP 112. "Shifting Comparative Advantage, Protectionist Demands, and Policy Response," by Jagdish N. Bhagwati

CP 113. "Trade in Differentiated Products and the Political Economy of Trade Liberalization," by Paul Krugman

CP 114. "Endogenous Tariffs, the Political Economy of Trade Restrictions, and Welfare," by Ronald Findlay and Stanislaw Wellisz

CP 115. "Tariff Seeking and the Efficient Tariff," by Jagdish N. Bhagwati and Robert C. Feenstra

CP 116. "The Political Economy of Protectionism," by Robert E. Baldwin

CP 117. "Adjustment in Process: A Lancashire Town," by Ronald P. Dore

CP 118. "European Community Protection against Manufactured Imports from Developing Countries: A Case Study in the Political Economy of Protection," by E. Verreydt and Jean Waelbroeck

WP 552. "Import Competition and Macroeconomic Adjustment under Wage-Price Rigidity," by Michael Bruno

WP 556. "Trade Adjustment Assistance under the U.S. Trade Act of 1974: An Analytical Examination and Worker Survey," by J. David Richardson

# Reprints Available

The following NBER Reprints, intended for nonprofit education and research purposes, are now available. (Previous issues of the *NBER Reporter* list titles 1-145 and contain abstracts of the Working Papers cited below.)

146. "Monetary, Financial, and Fiscal Policies under Rational Expectations," by Willem H. Buiter, 1980 (NBER Working Paper No. 412)

147. "The Effects of Taxation on the Selling of Corporate Stock and the Realization of Capital Gains," by Martin Feldstein, Joel Slemrod, and Shlomo Yitzhaki, 1980 (NBER Working Paper No. 250), and "The Lock-in Effect of the Capital Gains Tax: Some Time-Series Evidence," by Joel Slemrod and Martin Feldstein, 1978 (NBER Working Paper No. 257) These two articles are bound within the same cover.

148. "The Consumer Price Index and the Measurement of Recent Inflation," by Alan S. Blinder, 1980

149. "International Differences in Social Security and Saving," by Martin Feldstein, 1980 (NBER Working Paper No. 355)

150. "Postwar Changes in the American Financial Markets,"by Benjamin M. Friedman, 1980 (NBER Working Paper No. 458)

151. "Postwar Macroeconomics: The Evolution of Events and Ideas," by Robert J. Gordon, 1980 (NBER Working Paper No. 459)

152. "Trends in U.S. International Trade and Investment since World War II," by William H. Branson, 1980 (NBER Working Paper No. 469)

153. "The Evolution of the American Labor Market, 1948-80," by Richard B. Freeman, 1980 (NBER Working Paper No. 446)

154. "The Level and Distribution of Economic Well-Being," by Alan S. Blinder 1980 (NBER Working Paper No. 488)

155. "Rational Expectations, Business Cycles, and Government Behavior," by Herschel I. Grossman, 1980

156. "Uncertainty, Industrial Structure, and the Speed of R and D," by Partha Dasgupta and Joseph E. Stiglitz, 1980

157. "Monetary Poicy and Long-Term Interest Rates: An Efficient Markets Approach," by Frederic S. Mishkin, 1981 (NBER Working Paper No. 517)

158. "Real User Costs and the Demand for Single-Family Housing," by Patric Hendershott, 1980

159. "Experience, Performance, and Earnings," by James L. Medoff and Katharine G. Abraham, 1980 (NBER Working Paper No. 278)

160. "Why Is There Mandatory Retirement?" by Edward P. Lazear, 1979

161. "Temporary Income Taxes and Consumer Spending," by Alan S. Blinder, 1981 (NBER Working Paper No. 283)

162. "The Incidence and Allocation Effects of a Tax on Corporate Distributions," by David F. Bradford, 1981 (NBER Working Paper No. 349)
163. "An Econometric Model of Tenure Choice and Demand for Housing as a Joint Decision," by Mervyn A. King, 1980
164. "Intermediate Imports, the Terms of Trade, and the Dynamics of the Exchange Rate and Current Account," by Maurice Obstfeld, 1980 (NBER Working Paper No. 540)
165. "Applied Welfare Economics with Discrete Choice Models," by Kenneth A. Small and Harvey S. Rosen, 1981 (NBER Working Paper No. 319)
166. "On Search and Equilibrium Price Distributions," by Joseph E. Stiglitz, 1979
167. "Taxation and the Stock Market Valuation of Capital Gains and Dividends: Theory and Empirical Results," by Roger H. Gordon and David F. Bradford, 1980 (NBER Working Paper No. 409R)
168. "Inflation and the Tax Treatment of Firm Behavior," by Alan J. Auerbach, 1981 (NBER Working Paper No. 547)
169. "Private Pensions and Inflation," by Martin Feldstein, 1981 (NBER Working Paper No. 568)
170. "On the Theory of Effective Demand," by Jerry Green, 1980
171. "Private versus Public Enforcement of Fines," by A. Mitchell Polinsky, 1980 (NBER Working Paper No. 338)
172. "Adjusting Depreciation in an Inflationary Economy: Indexing versus Acceleration," by Martin Feldstein, 1981 (NBER Working Paper No. 395)
173. "Transfers, Taxes, and the NAIRU," by Daniel S. Hamermesh, 1981 (NBER Working Paper No. 548)
174. "Inventories and the Structure of Macro Models," by Alan S. Blinder, 1981 (NBER Working Paper No. 515)
175. "Reconsidering the Work Disincentive Effects of Social Security," by Alan S. Blinder, Roger H. Gordon, and Donald E. Wise, 1980 (NBER Working Paper No. 562)
176. "Home Production—A Forgotten Industry," by Reuben Gronau, 1980 (NBER Working Paper No. 148)

These reprints are free of charge to corporate associates and other sponsors of the National Bureau. For all others there is a charge of $1.50 per reprint to defray the costs of production, postage, and handling. Advance payment is required on orders totaling less than $10.00. Reprints must be requested by number, in writing, from: Reprint Series, National Bureau of Economic Research, 1050 Massachusetts Avenue, Cambridge, MA 02138.

## Summary Reports

NBER's third summary report, *Economics of Compensation*, was published this spring. The thirty-page booklet, written in nontechnical language and designed for a general audience, summarizes the ten papers presented at the NBER Conference on the Economics of Compensation held in November 1980. (See *NBER Reporter*, Winter 1980, for a list of these papers.) This report may be obtained free of charge from the Publications Department, National Bureau of Economic Research, 1050 Massachusetts Avenue, Cambridge, MA 02138.

# Bureau Books

Two new NBER volumes will be available this fall through the University of Chicago Press:

*Studies in Labor Markets*, edited by Sherwin Rosen

*Risk and Capital Adequacy in Commercial Banks*, edited by Sherman Maisel

The Rosen volume contains a selection of current research in labor economics. The thirteen papers, originally presented at a Universities-NBER conference on labor markets, focus on four themes: labor mobility, job turnover, and life-cycle dynamics; unemployment compensation and employment policy; labor market discrimination; and labor market information and investment.

Maisel's volume presents a new approach to monitoring and controlling the probability of bank failures in the United States. It asks how risks arise, how they can be measured, and how they can be minimized. By applying econometric techniques to the analysis, this collection of articles shows how decision making within banks and regulatory agencies might be improved.

Both volumes should be ordered directly from the University of Chicago Press, Order Department, 11030 South Langley Avenue, Chicago, IL 60628. The cost of the Rosen volume is $34.00; the Maisel volume is $42.00. An academic discount of 10 percent for individual volumes and a 20 percent discount for standing orders for *all* NBER books published by the University of Chicago Press are available to university faculty; orders must be sent on university stationery.

A third NBER volume, *Export Diversification and the New Protectionism: The Experiences of Latin America*, edited by Malcolm Gillis and Werner Baer, is now available from the University of Illinois Press. This volume of twelve empirical and theoretical papers, presented at a 1980 conference on trade prospects among the Americas, focuses on trade relations between Latin America and the advanced industrial countries, especially the United States. The book should interest not only academics but also public officials in North and South America and business people concerned with hemisphere trade and development issues. It is priced at $24.00 and should be ordered directly from The University of Illinois Press, Order Department, P.O. Box 5081, Station A, Champaign, IL 61820.

Two other NBER volumes will be available in November: *A Treatise on the Family*, by Gary Becker, and *Studies in Public Regulation*, edited by Gary Fromm. The Becker

volume, published by Harvard University Press, applies economic theory to personal decisions such as choosing a spouse or having children. Although the work is primarily theoretical, Becker discusses such practical implications as the effect of social welfare programs on the resource allocation within families. Becker's book is priced at $20.00 and should be ordered directly from Harvard University Press, 79 Garden Street, Cambridge, MA 02138.

The Fromm volume, published by MIT Press, is based on papers presented at a joint NBER-National Science Foundation conference held in 1977. The papers, written by economists and public policy specialists, encompass: regulation theory and practice, regulators' concerns with income distribution, solvency regulation on railroad investment, and regulation of telecommunications in Canada. The Fromm book costs $45.00 and should be ordered directly from MIT Press, 28 Carleton Street, Cambridge, MA 02139.

NBER corporate associates will automatically receive all volumes, and other contributors to the National Bureau may order books at a discount from the Bureau's publications department.

# Technical Papers Series

Additional studies in the NBER Technical Working Papers series are now available (see previous issues of the *NBER Reporter* for other titles). Like NBER Working Papers, these studies may be obtained by sending $1.50 per paper to: Technical Working Papers, National Bureau of Economic Research, 1050 Massachusetts Avenue, Cambridge, MA 02138. Prepayment is required for all orders under $10.00.

## A Note on the Solution of a Two-Point Boundary Value Problem Frequently Encountered in Rational Expectations Models

**Willem H. Buiter**
Technical Working Paper No. 12
June 1981
JEL No. 213

This paper analyzes a class of two-point boundary value problems for systems of linear differential equations with constant coefficients. The boundary conditions are expressed as linear restrictions on the state vector at an initial time and at a finite terminal time. This is applicable even if the terminal conditions involve the asymptotic convergence of the system to steady-state equilibrium, as is frequently the case in economic applications. It is also a suitable format for numerical applications using existing computer routines. The case in which there are more stable eigenvalues than predetermined state variables is also considered. An example involving a small, open-economy macroeconomic model is used to illustrate the analysis.

## Macroeconometric Modeling for Policy Evaluation and Design

**Willem H. Buiter**
Technical Working Paper No. 13
June 1981
JEL Nos. 023, 133, 212

This paper reviews recent developments in macroeconomic theory and their implications for econometric modeling and policy design. The following issues are addressed: (1) the theoretical and practical problems of modeling sequence economies; (2) problems of evaluating the role of money given the absence of reasonable microfoundations for monetary theory; (3) the implications of the view that macroeconomic models should be viewed as noncooperative differential games; (4) identification and estimation of the policy-invariant structure of rational expectations models; (5) time inconsistency of optimal plans; and (6) the welfare economics of stabilization policy and the need to pay much greater attention to market structure if a market failure-based justification for stabilization policy is to be developed.

## Asymptotic Properties of Quasi-Maximum Likelihood Estimators and Test Statistics

**Thomas E. MaCurdy**
Technical Working Paper No. 14
June 1981

This paper examines the consequences of using maximum likelihood estimation techniques based on the assumption of joint normality when the error distribution does not necessarily belong to the family of normal distributions. A nonlinear, seemingly unrelated regression model with covariance restrictions provides the basic statistical framework considered in this analysis. In addition to discussing methods where one simultaneously estimates all parameters, this study examines computationally efficient procedures designed to estimate only regresion coefficients or only parameters of the covariance matrix. All methods are shown to generate estimators that are consistent and normally distributed in large samples even in the absence of normality. The following analysis also derives the general asymptotic properties of statistics typically used to test composite hypotheses in a large-sample setting, including the Wald, the likelihood ratio, and the Lagrange multiplier test statistics. Without the assumption of normality, the likelihood ratio and Lagrange multiplier statistics still converge to the usual chi-squared distribution when used to test restrictions on regression coefficients but diverge from this distribution when used to test any sort of covariance restrictions.

# 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 $1.50 per copy to Working Papers, National Bureau of Economic Research, 1050 Massachusetts Avenue, Cambridge, MA 02138. Please make checks payable to the National Bureau of Economic Research, Inc.

*Journal of Economic Literature* (JEL) subject codes, when available, are listed after the date of the Working Paper. Abstracts of all Working Papers issued since April 1981 are presented below. For previous Working Papers, see past issues of the *NBER Reporter*. The Working Papers are intended to make results of NBER research available to other economists in preliminary form, to encourage discussion and suggestions for revision before final publication. Working Papers are not reviewed by the Board of Directors of NBER.

## The Federal Minimum Wage, Inflation, and Employment

**John Boschen** and **Herschel Grossman**
Working Paper No. 652
April 1981
JEL No. 824

This study investigates the effects of federal minimum wage policy on minimum wage employment, aggregate employment, and average wage rates. The theoretical analysis focuses on the possible effect of the federal minimum wage in constraining wages and employment in a subset of labor markets, responses of labor suppliers to these constraints, and the role of the policy of presetting the nominal minimum wage in making monetary policy nonneutral. Among the elements of the theoretical framework that are both distinctive and important are the assumptions that both the demands and supplies of labor services in the subset of constrained markets depend on the expected relative minimum wage in the near and distant future, as well as on the current relative minimum wage and on past levels of employment, and that the relevant expectations of both workers and employers about relative minimum wages are rational. The main conclusions from this study are:

(1) Increases in the current or near-future federal minimum wage appear to depress current employment in certain industries that probably have a high proportion of minimum wage workers and among teenagers, the demographic group that has the highest incidence of minimum wage workers.

(2) Neither the current nor the near-future federal minimum wage appear to affect either current aggregate employment or average wage rates. This finding suggests that the curtailment of employment opportunities in certain industries and for teenagers that apparently results from minimum wage policy produces two types of response. First, to some extent affected workers possibly take employment in other industries. Second, to some extent other individuals, who are not teenagers and/or who work in other industries, apparently increase their employment.

(3) Federal minimum wage policy and, specifically, the role of monetary policy in determining the real value of the preset nominal minimum wage do not seem to account even in part for the relation between monetary policy and aggregate employment. Monetary nonneutrality apparently results from other undetermined factors.

(4) The effect of proposed indexation of the federal minimum wage on the average employment of minimum wage workers over time would depend inversely on the chosen relation between the federal minimum wage and recent past average wage rates relative to the level and trend of the expected rate of average wage inflation. The effect of proposed indexation on the variability over time of employment of minimum wage workers would depend directly on the amount of year-to-year variation in expected wage inflation relative to the amount of year-to-year variation in unexpected wage inflation.

## Indexation of the Minimum Wage with Rational Expectations

**Herschel Grossman**
Working Paper No. 653
April 1981
JEL No. 824

This paper considers the possible effects on employment of indexing the nominal minimum wage. I assume that both the demand for the labor services of minimum wage workers and the setting of the nominal minimum wage rate depend in part on rational expectations of future average wage rates. The analysis implies that:

(1) If the indexation ratio of the nominal minimum wage to the recent past average wage rate were large relative both to the level and trend of the expected rate of inflation of the average wage and to the existing relative minimum wage target, then indexation would decrease the average level of employment at the minimum wage over time.

(2) If the relative year-to-year variation in expected wage inflation to unexpected wage inflation were large, then indexation would increase the year-to-year variation in employment at the minimum wage.

## Early Retirement Pension Benefits

**Jeremy I. Bulow**
Working Paper No. 654
April 1981

Early retirement options alter the accrual of pension benefits, increasing the fraction of total benefits that are accrued in the early years of work. This is true regardless of whether no worker in fact opts for early retirement. No current actuarial method correctly calculates the cost of an early retirement option, even though it must be considered in calculating age/compensation profiles. Furthermore, the early retirement option can be used effectively to encourage less productive older workers to retire without the firm having to reduce the nominal salary of such workers.

## The Effects of Government Regulation on Teenage Smoking

**Douglas Coate, Michael Grossman,** and **Eugene M. Lewit**
Working Paper No. 655
April 1981
JEL No. 913

We examine the impact of three sets of government regulations on the demand for cigarettes by teenagers in the United States: (1) the excise tax on cigarettes; (2) the fairness doctrine of the Federal Communications Commission, which resulted in the airing of antismoking messages on radio and television from July 1, 1967 to January 1, 1971; and (3) the Public Health Cigarette Smoking Act of 1970, which banned pro-smoking cigarette advertising on radio and television after January 1, 1971.

Teenage price elasticities of demand for cigarettes are substantial and much larger than the corresponding adult price elasticities: teenage smoking-participation elasticity is -1.2, and the quantity-smoked elasticity is -1.4. It follows that, if future reductions in youth smoking are desired, an increase in the federal excise tax is a potent policy to accomplish this goal.

The contention of the proponents of the advertising ban that the fairness doctrine failed in the case of teenagers is incorrect. According to our results, the doctrine had a substantial negative impact on teenage smoking participation rates. Extrapolations suggest that the advertising ban was no better or worse a policy than the fairness doctrine.

## Minimum Wages and the Demand for Labor

**Daniel S. Hamermesh**
Working Paper No. 656
April 1981
JEL No. 820

I formulate measures of the effective minimum wage, based on broad definitions of the labor costs that face employers and use these measures in reestimating some simple equations relating the relative employment of youths and adults to the U.S. minimum wage using aggregate data for 1954–78. I then ground the model more closely in the theory of factor demand, first by adding the relative wages of youths and adults to the equation describing their relative employment, and then by specifying a complete system of demand equations for these two types of labor. Teen employment responds quite robustly to changes in the effective minimum in these specifications, with an elasticity of -0.1. A translog cost function defined over young workers, adults, and capital shows that the effective minimum wage reduces employers' ability to substitute other factors for young workers. Using both sets of results, I find that a subminimum wage for youths would have increased their employment with at most a small loss of jobs among adults.

## Housing Behavior and the Experimental Housing Allowance Program: What Have We Learned?

**Harvey S. Rosen**
Working Paper No. 657
April 1981
JEL No. 932

The purpose of this paper is to evaluate the Experimental Housing Allowance Program (EHAP). My focus is on what the experimental data have taught us that could not have been learned from more traditional sources of information. I review the major problems that confronted investigators using nonexperimental data and discuss whether these problems were mitigated by the availability of EHAP data. I conclude that if the goal was to obtain improved estimates of the behavioral response to housing allowances, then a social experiment was not necessary.

## Real Exchange Rate Adjustment and the Welfare Effects of Oil Price Decontrol

**Paul Krugman**
Working Paper No. 658
April 1981

Conventional analysis of the welfare effects of U.S. oil price regulation in the 1970s focuses on the deadweight losses in the oil market. This paper argues that such analysis substantially understates the benefits of decontrolling prices, because decontrol leads to an improvement in the U.S. terms of trade with respect to other oil importing countries. I develop a simple model of the relationship between oil decontrol and the terms of trade and calculate the impact for plausible parameter values. The results suggest that the terms of trade benefits are several times larger than the benefits as conventionally measured.

## The Effect of Social Security on Retirement in the Early 1970s

**Michael J. Boskin** and **Michael D. Hurd**
Working Paper No. 659
April 1981
JEL No. 915

In an attempt to better understand retirement behavior, one key to many important economic problems, we consider the behavior of a cohort of white males during a period in which Social Security benefits increased substantially: 28 percent on average from 1970–72, and over 50 percent in real terms (for the maximum benefit) between 1968 and 1976. Other important structural changes in the method of computing benefits were made during this period, too, so we have extremely detailed longitudinal data on a cohort of men aged 58–67 during a period of abrupt change in their economic incentives to retire.

We have analyzed these data in a variety of ways to ascertain the impact of the changes in Social Security, as well as other factors, on retirement probabilities. We infer the following:

(1) The accelerating decline in the labor force participation of elderly men over the period 1969–73 was primarily due to the large increase in real Social Security benefits. Using probability equations to estimate the effects of changes in real benefits, we predict declines in participation rates virtually identical to the actual observed declines.

(2) Social Security wealth interacts with other assets in influencing retirement. A substantial fraction of the elderly appear to have few other assets and this group shows a markedly larger propensity to retire early (when Social Security benefits become available). We find strong evidence of this liquidity constraint effect for an important subgroup of the elderly.

(3) The magnitude of the induced retirement effect is large enough that if it is ignored in estimating the direct fiscal implications of major changes in benefit provisions, these fiscal implications may be substantially underestimated.

(4) We interpret our results in the historical context of a particular cohort undergoing a major, unanticipated transfer of wealth via larger real benefits. We make no attempt to distinguish these from the long-run effects if the system were to remain unchanged for many years or if future changes were readily predictable.

## Raw Materials, Profits, and the Productivity Slowdown

**Michael Bruno**
Working Paper No. 660
April 1981

The first object of this paper is to provide a relatively simple and transparent framework within which the main short-run and long-run real effects of price increases for raw materials can be analyzed. This is based on the factor price frontier, which provides a concise summary of the interactions of the technology, factor use, and real factor price effects. In particular it brings out the analogy of an increase (decrease) in raw material prices with that of autonomous technological regress (progress).

This framework is used to analyze the long-run changes of profits and total productivity in the manufacturing sectors of four major industrial economies—the United States, the United Kingdom, Germany, and Japan. The respective factor price profiles bring out the major role of raw materials in the profit and product-wage squeeze after 1972, with some interesting differences between countries. It also throws some light on the cyclical versus long-run behavior of profits, particularly for the United States.

The production model, in conjunction with some estimates obtained from the factor price frontier, attributes almost all of the slowdown in total productivity to the rise in relative prices of raw materials. In almost none of the cases examined is any large residual left unexplained. It is also shown that part of the apparent productivity riddle has to do with the common use of double-deflated national accounting measures of value added, which have an inherent measurement bias.

## Taxation and Corporate Pension Policy

**Irwin Tepper**
Working Paper No. 661
April 1981

This paper examines the tax advantages to corporations or their employees of having pension plans and funding and investing in such plans. Pension fund earnings are considered to be exempt from corporate taxation (this assumption is justified in the Appendix), and the personal tax rate on equity returns is assumed to be less than the rate on bond returns. The Miller case, in which there is no tax advantage to corporate leverage, is thus encompassed. The analysis shows that if the firm considers the tax benefit to be the most important determinant of its funding policy, then it will fund pension plans. This follows from the fact that the return on debt held in a corporate pension fund is passed through the firm to the shareholder and is thus taxed at the lower personal tax rate on equities. The shareholder will pay less tax than if the debt were held in his own portfolio. The shareholder is better off if the pension funds of the corporations he invests in maximize their bond (and not equity) commitments while he minimizes bond commitments in his personal portfolio and invests directly in equities.

## Suit and Settlement versus Trial: A Theoretical Analysis under Alternative Methods for the Allocation of Legal Costs

**Steven Shavell**
Working Paper No. 662
April 1981
JEL No. 022

Will a party who believes that he has a legally admissible claim for money damages decide to bring suit? If so, will he subsequently settle with the opposing party, or will he go ahead to trial? I analyze these questions considering four ways of allocating legal costs: (1) the American system, whereby each side bears its own costs; (2) the "indemnity" or British system, whereby the losing side bears all costs; (3) the system favoring the plaintiff, whereby the plaintiff pays only his own costs if he loses and nothing otherwise; and (4) the system favoring the defendant, whereby the defendant pays only his own costs if he loses and nothing otherwise. Following the analysis, I consider two brief illustrations and comments on the relative social desirability of the methods of allocating legal costs.

## Distributional Implications of Imperfect Capital Markets

**Joon Koo Lee**
Working Paper No. 663
April 1981
JEL No. 850

The primary aim of this study is to analyze the impact of imperfections in capital markets on individuals' lifetime allocation plans and the resulting implications for income distribution. The model builds upon Samuelson's overlapping generation model with human capital and bequest motives playing central roles. The model developed here introduces a limit on the individual's ability to borrow. One of the most important consequences of this constraint is that human investment falls short of the level where its marginal return is equal to that of nonhuman investment. The comparative static results show that an individual who has been subject to the borrowing constraint would increase human investment unambiguously if he were allowed to borrow freely against future earnings. Discussions of the distributive implications of this result suggest that the elimination of the borrowing constraint has a potential for enhancing both intragenerational income equality and intergenerational mobility. The simulation results show that the elimination of the borrowing limit would bring about a significant improvement in income distribution without having an adverse effect on efficiency.

## Profitability and Stability in International Currency Markets

**John F. O. Bilson**
Working Paper No. 664
April 1981
JEL No. 431

A number of recent empirical studies have rejected the hypothesis that forward exchange rates are unbiased forecasts of future spot exchange rates. This result implies that there have been opportunities for speculative profit during the post-Bretton Woods period. Observers of the floating rate system have also noted that exchange rates have been more volatile than they were anticipated to be in the 1960s. In this paper, I explore the link between the volatility of exchange rates and the existence of opportunities for speculative profit. The question that the paper answers is: if there were no opportunities for speculative profit, would exchange rates have been more stable? The answer is yes. This answer implies that speculation (intervention) based upon the forecasting equation described in the paper would be both profitable and stabilizing.

## Business Cycles and Growth: Some Reflections and Measures

**Victor Zarnowitz**
Working Paper No. 665
April 1981
JEL Nos. 110, 130

No simple and stable relationship can be expected to exist between long-term economic growth and cyclical variability; they interact and depend on various factors, some common and some different. However, measures relating to the annual growth rates in real GNP since 1882 suggest that growth was generally higher during those multicycle periods when stability was greater.

The mildness of economic fluctuations in the 1950s and 1960s led to an international revival of interest in growth cycles (cyclical movements in trend-adjusted indicators). Measures of several important aspects of growth cycles, such as duration of phases and timing of the indicators, show much greater symmetry and more uniformity than their counterparts for business cycles. For several of the recent growth cycles, the degree of international diffusion is high.

The expansions and contractions of the early business cycles in the NBER chronology tend to be of nearly equal length, much like the phases of growth cycles and very unlike those of the more recent business cycles. However, the identification of these movements relied to a considerable extent on business annals and trend-adjusted indexes of business conditions, information that is not capable of efficiently discriminating between mild declines and pronounced retardations in economic activity. A reexamination of the evidence and literature indicates

that some of the episodes in the 150 years of U.S. economic history may represent phases of below average growth rather than genuine contractions. If this were the case, even only in the few most doubtful instances that are limited to the 19th century, it would imply an underestimation of expansions relative to contractions in the cycles of the first half of the chronology. The contrast between the early and the recent cycle, however, would only be reduced, not eliminated.

## Currency Baskets and Real Effective Exchange Rates

**William H. Branson** and **Louka T. Katseli**
Working Paper No. 666
April 1981
JEL No. 430

With the major currencies continuously moving against each other (if not floating freely), a country that does not choose to float must decide what to peg to. If it pegs to the SDR, it floats against all currencies. Thus, in the system begun in the early 1970s, the very concept of a fixed exchange rate is unclear. In this situation, many countries have chosen to peg their currencies to a basket: a weighted average of other currencies.

This paper focuses on fluctuations in real exchange rates. We show first that pegging to a currency basket is the same as holding constant a real, effective exchange rate using a specific set of weights that depend on a chosen policy target. We also show the weights that correspond to particular targets for stabilization policy.

Next we discuss several problems involved in choosing and computing optimal weights or the equivalent real effective rate. We show that the index formula itself aggregates countries that are in a currency area, so that monetary authorities should use weights based on trade with countries rather than on the currency denomination of that trade.

Finally, we report on an initial empirical investigation of pegging practices in Greece, Portugal, and Spain. These are all countries that have moved to basket pegs, with geographically diversified trade. We present initial estimates of the implicit weights in their baskets and find that all three countries experienced real appreciation relative to the basket during the 1970s.

## Expected Interruptions in Labor Force Participation and Sex Related Differences in Earnings Growth

**Reuben Gronau** and **Yoram Weiss**
Working Paper No. 667
April 1981
JEL No. 851

This paper analyzes the joint determination of wives' earnings and labor force participation over the life cycle given the interruptions in wives' working careers. The interruptions affect the profitability of the investment in human capital, which in turn determines earnings. The earnings prospects feed back into the participation decision, namely, the decision whether and for how long to drop out of the labor force.

The formal analysis compares the age-earnings profiles of persons who drop out of the labor force with those who do not during the pre- and post-interruption period. The comparison is carried out with interruptions assumed to be exogenous and then endogenous. The effects on the length of the interruption of productivity at home, the initial stock of human capital, and its rental value are investigated.

## Wives' Labor Force Participation, Wage Differentials, and Family Income Inequality: The Israeli Experience

**Reuben Gronau**
Working Paper No. 668
April 1981
JEL No. 921

Recent decades have witnessed a sharp increase in the labor force participation of married women. This paper investigates the effect of wives' earnings on the distribution of family incomes. This effect depends on the inequality of women's earnings as compared with other sources of income, on the correlation between the two, and on the woman's share in total income. These in turn depend on participation patterns, labor supply, and sex related wage differentials. In general, only the correlation between the various sources of income has an unambiguous effect on inequality; the effects of the other factors depend on the specific values of the parameters.

In Israel, where there are sharp differences in participation rates of married women and in sex related earnings differentials by schooling group, wives' earnings reduce total family income inequality, increasing at the same time the between-group (ethnic and schooling group) variability. The paper examines the effect on family income inequality of changes in the participation rate and the wife-husband earnings gap. It compares the effect of wives' earnings with other income sources (for example, transfers) and examines the implication of separate tax returns for inequality.

## The Federal Attack on Labor Market Discrimination: The Mouse That Roared?

**Charles Brown**
Working Paper No. 669
May 1981
JEL Nos. 917, 822

This paper reviews available evidence on the impact of federal equal employment opportunity programs. While

Title VII of the Civil Rights Act of 1964 and Executive Order 11246 have been in effect for over fifteen years, the lag in data collection and evaluation means that little can be said regarding the last few years' experience. In particular, evidence on the impact of recent administrative changes in the agencies responsible for enforcement is unavailable.

In general, time-series studies find significant improvements in the relative labor market position of blacks compared with whites since 1965. While several arguments have been advanced that these gains are illusory, the most plausible interpretation is that much of the apparent progress is real.

Cross-sectional studies of the impacts of the Office of Federal Contract Compliance Programs (which enforces the nondiscrimination and affirmative action requirements of the Executive Order) and of the Equal Employment Opportunity Commission (which enforces Title VII) have been much less conclusive. Half of the major studies of the OFCCP find that the program had the intended effects on the relative position of blacks or at least black males. Unfortunately, variations in conclusions among studies are not readily explained, even after a careful look at the competing data and methods. Equally disturbing is the inability of studies producing positive results to associate such impacts with the "levers" by which OFCCP might exert influence. Studies of EEOC impacts are more vulnerable to problems of identifying the appropriate control group, since Title VII covers contractor and noncontractor firms. Apart from evidence that relative black employment grew considerably faster in firms that must report to EEOC (firms with over 15 employees are subject to Title VII, but only those with 100 or more must report to EEOC), available studies have not produced consistent evidence of EEOC impact.

Besides the lack of strong cross-sectional support for the time-series conclusions, three puzzles emerge: (1) What caused the decline in black male labor force participation that began about the same time as the federal antidiscrimination effort? (2) Why did black females advance more rapidly than black males since the federal effort began? (3) Why did advantaged blacks advance more rapidly than less advantaged blacks?

## Indexing and Inflation

**Stanley Fischer**
Working Paper No. 670
May 1981

Much of the opposition to indexation as a means of adapting to ongoing inflation arises from the view that indexation is itself inflationary. This paper examines the basis for that view in a simple macroeconomic model in which budget deficits are in part financed through the printing of money. It is shown that all aspects of indexing —wage indexation, bond indexation, and tax indexation —tend to increase the impact on the price level of any inflationary shock. However, this association between indexation and inflation is in large part a consequence of the monetary and fiscal policies being followed by the government.

Evidence from a cross-section of forty countries on the effects of indexation on the inflationary impact of the oil price shock of 1974 suggests that indexation did not in general increase the inflationary impact of the oil shock. However, the impact of the oil shock was significantly stronger in those countries that had adopted bond indexation.

## Training, Tenure, and Productivity

**Frank R. Lichtenberg**
Working Paper No. 671
May 1981
JEL No. 377

There is substantial evidence from the literature that, holding constant employee attributes such as age, sex, and education, length of service to the firm is an important determinant of an indvidual's earnings and thus of labor productivity. Earnings growth associated with increased tenure is usually interpreted as a reflection of firm-specific on-the-job training (OJT). In this paper I formulate and estimate a model of producer technology consistent with the hypothesis of firm-specific OJT. Implementing the model empirically on data for U.S. manufacturing, I can estimate the marginal productivity of workers classified by length of service to their firms, that is, the tenure-productivity profile. These estimates also enable us to determine the effect of recent changes in the tenure distribution (due to changes in labor turnover behavior) on productivity performance in the manufacturing sector.

## A Competitive Theory of Monopoly Unionism

**Edward P. Lazear**
Working Paper No. 672
May 1981
JEL No. 800

This paper sets up a microeconomic theory of labor unions. It discusses their formation and goals, their hierarchical structure, and the nature of rent distribution. The theory provides predictions of the probability that an industry or occupation will be unionized, the proportion of that industry that will be unionized, and observed wage differentials within that industry. It discusses the way that those values change in response to changes in the supply of labor, demand for labor, cost of organizing the union, and cost of defeating the union. Institutions such as featherbedding, fringe benefits, and seniority are rationalized in this framework. The model is consistent with competitive factor and product markets.

## A Reexamination of Tax Distortions in General Equilibrium Models

**Don Fullerton** and **Roger Gordon**
Working Paper No. 673
May 1981
JEL Nos 522, 521, 323

General equilibrium models have been used recently to simulate the effects of proposed tax changes. However, in analyzing the effects of the government on the economy, these models have assumed for simplicity that marginal tax rates equal the observed average tax rates, and that marginal benefit rates are zero.

The main purpose of this paper is to derive improved estimates of various marginal tax and benefit rates. Most important, we include in the model recent theories concerning the effects of combined corporate and personal taxes on corporate financial and investment decisions. The conclusions previously derived concerning the effects of corporate tax integration are then reexamined in light of the proposed changes.

## Wage-Employment Contracts: Global Results

**Jerry Green** and **Charles Kahn**
Working Paper No. 675
May 1981
JEL Nos. 023, 131, 821

This paper considers efficient agreements about the dependence of workers' earnings on employment when the employment level is controlled by firms. The firms' superior information about profitability conditions is responsible for this form of contract governance. Under plausible assumptions, such agreements will cause employment to diverge from efficient levels as a by-product of attempts to mitigate risk. It is shown that if leisure is a normal good and firms are risk-neutral, then employment is *always above* the efficient level. Such a one-period implicit contracting model cannot, therefore, be used to "explain" unemployment as a rational by-product of risk sharing between workers and a risk-neutral firm under conditions of asymmetric information.

## Have Angels Done More?: The Steel Industry Consent Decree

**Casey Ichniowski**
Working Paper No. 674
May 1981
JEL No. 820

This study analyzes the consent decree that reformed plant seniority systems to accommodate issues of equal employment opportunity in the U.S. basic steel industry. The plant-by-plant litigation brought under Title VII and Executive Order 11246 is shown to be the main catalyst; it brought representatives of the steel industry, the United Steel Workers of America, and the appropriate government agencies together to negotiate this industrywide solution. The principal terms of the steel industry consent decree are: (1) the establishment of a mechanism to implement the decree; (2) the uniform institution of plant-wide seniority; (3) the retention of pay rates after transfer to a position that provides a lower pay rate than the previous position; (4) the establishment of goals for minority representation in trade and craft jobs; and (5) a back pay settlement. The analysis of these provisions reveals two related points. First, black representation in trade and craft jobs increased in the four-year period after the decree, with some indication that the increase was greater than pre-1974 employment trends would have predicted. Second, 1978 black/white employment figures indicate that underutilization of blacks in these positions still persists.

## Quantity and Elasticity Spillovers onto the Labor Market: Theory and Evidence on Sluggishness

**Allen Drazen, Daniel S. Hamermesh,** and **Norman P. Obst**
Working Paper No. 676
May 1981
JEL Nos. 824, 023

Firms' beliefs that they may be unable to sell as much as they would like at the market price lead not only to a quantity spillover (even when prices are flexible) but also to a spillover of product demand elasticity onto labor demand elasticity. Hence, optimal firm behavior can be expected to produce a negative correlation between the (absolute value of) wage elasticity and the unemployment rate. This hypothesis is tested on three sets of data with the following findings: (1) for low-skilled workers in the United States in 1969, there is weak support for this hypothesis; (2) in time-series data for the United States, there is no evidence for the hypothesis (there is essentially no cyclical variability in the elasticity); and (3) in time-series data for the United Kingdom, there is fairly strong evidence supporting it. We also find that, in both the United States and the United Kingdom, the elasticity of demand for labor decreased in the 1970s to an extent that does not appear to be explained by changes in other factor prices.

## Estimated Output, Price, Interest Rate, and Exchange Rate Linkages among Countries

**Ray C. Fair**
Working Paper No. 677
May 1981

This paper provides quantitative estimates of the output, price, interest rate, and exchange rate linkages among a number of countries. The econometric model that is used for this purpose is described in Fair (1981), and the present paper is an extension of this work. The linkages are examined by changing various policy variables and observing the resulting change in the endogenous variables.

The model is also used to estimate what is called the "exchange rate effect" on inflation. One of the ways in which monetary and fiscal policies may affect a country's inflation rate is by first influencing its exchange rate, which in turn influences import prices, which in turn influences domestic prices. The model allows this exchange rate effect on inflation to be estimated.

The results in the paper give a good indication of the properties of the model. The linkages among countries are complicated and there are few unambiguous effects with respect to sign. This is true not just in principle but also in fact. Depreciation, for example, increases GNP for Japan but decreases it for Germany and the United Kingdom. A spending increase leads to a depreciation in Japan but to an appreciation in Germany and the United Kingdom. A spending increase in the United States has noticeably different effects on different countries. The results also show the importance of price, interest rate, and exchange rate linkages among countries as well as the usual trade linkages.

## Information and Capital Markets

**Joseph E. Stiglitz**
Working Paper No. 678
May 1981
JEL No. 026

This paper provides the foundations of a general theory of information and the capital market. In a pure gambling market, even with asymmetric information, there cannot exist an equilibrium with trade among rational individuals. Although a pure exchange stock market is not a pure gambling market, most of the trade on the stock market arises from irrationality on the part of some investors and the rational response on the part of others to take advantage of that irrationality.

Moreover, the private returns to the acquisition and dissemination of information differ markedly from the social returns and, as a result, the market equilibrium is not a (constrained) Pareto optimum. Firms' actions, for example the fraction of shares retained by the original entrepreneurs, the debt-equity ratio, and the level of investment, may convey information about firm characteristics. This in turn affects the behavior of firms. As a result, the original owners of firms will not be completely diversified, firms will not take actions that maximize their value in the stock market, and, in particular, they may behave in a risk-averse manner, paying attention to own risk (while traditional theory suggests that the only risk firms should care about is the correlation with the market).

## Has the Rate of Investment Fallen?

**Martin Feldstein**
Working Paper No. 679
May 1981
JEL No. 130

Although the ratio of gross, fixed nonresidential investment to GNP has decreased very little since the late 1960s, the corresponding *net* investment ratio declined by nearly 40 percent between the second half of the 1960s and the second half of the 1970s. Four-fifths of this decline was due to the increased ratio of depreciation to GNP and only one-fifth to the decreased ratio of gross investment to GNP. The increased ratio of depreciation to GNP was in turn due equally to the higher ratio of capital to GNP and the higher rate of depreciation. Nearly half of the higher depreciation rate was due to the increased rate of depreciation of equipment and nearly half to the increased share of equipment in the capital stock.

## Inflation, Capital Taxation, and Monetary Policy

**Martin Feldstein**
Working Paper No. 680
May 1981
JEL No. 321

This paper discusses the effects of the interaction between inflation and the taxation of capital income. The principal conclusions are:

(1) Inflation substantially increases the total effective tax rate on the income from capital used in the nonfinancial corporate sector. The total effective tax rate has risen from less than 60 percent in the mid-1960s to more than 70 percent in the late 1970s.

(2) The higher effective tax rate reduces the real net rate of return to those who provide investment capital. In the late 1970s, the real net rate of return averaged less than three percent.

(3) The interaction between inflation and existing tax rules contributed to the fall in the ratio of share prices to real pretax earnings, or, equivalently, to the rise in the real cost to the firm of equity capital.

(4) By reducing the real net return to investors and widening the gap between the firms' cost of funds and the maximum return that firms can afford to pay, the interaction between tax rates and inflation has depressed the rate of net investment in business fixed capital.

(5) The failure to consider correctly the effects of the fiscal structure has caused observers to underestimate the expansionary character of monetary policy in the past two decades.

(6) The goal of increasing investment while maintaining price stability can be achieved with tight money, a high real interest rate, and tax incentives for investment. A high real net-of-tax interest rate could reduce residential investment and other forms of consumer spending while the tax incentives offset the monetary effect for investment in business capital.

## Alternative Tax Rules and Personal Saving Incentives: Microeconomic Data and Behavioral Simulations

**Daniel Feenberg** and **Martin Feldstein**
Working Paper No. 681
May 1981
JEL Nos. 323

This study examines the potential effects on personal saving of alternative types of tax rules. The analysis makes use of two extensive samples of information on individual savings and financial income: the 1972 Consumer Expenditure Survey and a stratified random sample of 26,000 individual tax returns for that year.

The first type of tax rule that we consider would permit all taxpayers to make tax deductible contributions to individual savings accounts. The interest and dividends earned in these accounts would also accumulate untaxed. A potential problem with any such plan is that individuals could in principle obtain tax deductions without doing any additional saving merely by transferring preexisting assets into the special accounts. The evidence that we have examined indicates that this is not likely to be important in practice since most taxpayers currently have little or no financial assets with which to make such transfers. For example, a plan permitting contributions of 10 percent of wages up to $2000 a year would exhaust all the preexisting assets of 75 percent of households in just two years. Our evidence also shows that a ceiling on annual contributions of 10 percent of wages still leaves an increased saving incentive for more than 80 percent of households since fewer than 20 percent of households currently save as much as 10 percent a year. Specific simulations of a variety of such proposals show that even when income and substitution effects balance for a representative taxpayer (implying no change in his consumption), aggregate saving would rise considerably.

The second type of tax rule that we examine would increase the current $200 interest and dividend exclusion. In 1972, among families with incomes of $20,000 to $30,000, 55 percent had more than $200 of interest and dividends; for those with incomes of at least $30,000, 82 percent had more than $200 of interest and dividends. For such families, the $200 exclusion provides no incentive for additional saving. Our analysis considers four ways of strengthening the saving incentive while limiting the reduction in tax revenue: (1) a limit of $1000 on the interest and dividend exclusion; (2) a 50 percent exclusion of interest and dividends up to a $1000 limit; (3) exclusion of interest and dividends in excess of 5 percent of income over $10,000 with an exclusion limit of $1000; and (4) exclusion of 20 percent of interest and dividend income without any limit. The revenue effects of all of these options were found to be quite small. But even with quite modest elasticities of current consumer spending with respect to the relative prices of present and future consumption, these plans could increase saving by significantly more than the reduction in tax revenue.

## Simulating Nonlinear Tax Rules and Nonstandard Behavior: An Application to the Tax Treatment of Charitable Contributions

**Martin Feldstein** and **Lawrence Lindsey**
Working Paper No. 682
May 1981
JEL No. 323

This paper examines how the tax simulation method can be extended to incorporate nonlinear budget constraints and nonstandard economic behavior. We simulate the effect of extending the charitable deduction to nonitemizers and study the effect of alternative "floors."

The specific simulations indicate that extending the charitable deduction to nonitemizers would raise individual giving by about 12 percent of the existing total amount, or $4.5 billion at 1977 levels. The extension would reduce tax revenue by slightly less, about $4.1 billion. A floor of $300 or 3 percent of AGI would reduce the revenue loss by 30 to 40 percent, even if there is significant bunching. The effect of the floor in increased giving depends critically on whether taxpayers' behavior is guided by conventional demand principles or by the net altruism rule. A reasonable conclusion is that a floor would reduce giving by less than the increased revenue but that the difference between them would not be very large.

## The Decline in Black Teenage Employment: 1950–1970

**John Cogan**
Working Paper No. 683
May 1981

This paper examines the causes of the decline in black male teenage employment from 1950 to 1970. During this period, the employment-to-population ratio of black youth (age 16–19) declined from 46.8 percent to 27 percent. The white teenage employment ratio, in contrast, remained constant. The primary source of the decline is traced to the virtual demise of the market for low-skilled agricultural labor. All of the black teenage employment decline during this period occurred in the South. The employment ratio among those living outside the South actually increased. Within the South, the entire decline

in employment is accounted for by a reduction in agricultural employment.

This study argues that technological progress is the principal cause of the agricultural employment decline among black youths. Spurred by the rapid advance and adoption of labor-saving technology, southern agricultural production was transformed from a relatively labor-intensive process to a highly capital-intensive one. As a result, the demand for low-skilled agricultural labor plummeted. By 1970, a formerly important source of black youth employment virtually ceased to exist.

Black teenagers who were displaced from agricultural work were not absorbed by the nonagricultural sector. An additional finding of this paper is that the federal minimum wage acted as an important barrier to nonagricultural employment in the South. The raw data reveal significant reductions in black teenage employment growth in precisely those industries where coverage of the minimum wage was increased: retail trade, construction, and the service sector. Regression estimates indicate a quantitatively large minimum wage effect.

## On Nonuniqueness in Rational Expectations Models: An Attempt at Perspective

**Bennett T. McCallum**
Working Paper No. 684
June 1981
JEL Nos. 130, 023

Many macroeconomic models involving rational expectations give rise to an infinity of solution paths, even when the models are linear in all variables. Some writers have suggested that this nonuniqueness constitutes a serious weakness for the rational expectations hypothesis. One purpose of the present paper is to argue that the nonuniqueness in question is not properly attributable to the rationality hypothesis but, instead, is a general feature of dynamic models involving expectations. It is also argued that there typically exists, in a very wide class of linear rational expectations models, a single solution that excludes "bubble" or "bootstrap" effects—ones that occur *only* because they are arbitrarily expected to occur. A systematic procedure for obtaining solutions free from such effects is introduced and discussed. In addition, this procedure is used to interpret and reconsider several prominent examples with solution multiplicities, including ones developed by Fischer Black and John B. Taylor.

## Relative Prices, Employment, and the Exchange Rate in an Economy with Foresight

**Maurice Obstfeld**
Working Paper No. 685
June 1981
JEL No. 431

This paper studies the effects of monetary policy in a small, open economy with a floating exchange rate, sticky wages, and rational expectations in both the asset and labor markets. The model that is developed emphasizes the link between exchange rate depreciation and nominal wage inflation, embodying in it an expectations-augmented Phillips curve. The economy is assumed to produce both traded and nontraded goods and thus provides a framework in which to explore the connection between the dynamic behavior of the exchange rate and the supply structure and degree of openness of the economy. In addition, the paper examines the "vicious circle" hypothesis, showing how an explosive cycle of exchange rate depreciation and wage-price inflation may arise in response to an *expected* monetary expansion.

## Aggregate Spending and the Terms of Trade: Is There a Laursen-Metzler Effect?

**Maurice Obstfeld**
Working Paper No. 686
June 1981
JEL Nos. 411, 431

This paper investigates the spending and current account effects of permanent shifts in terms of trade in a model where households maximize utility over an infinite planning period. In the adopted framework, an economy specializing in production must experience a fall in aggregate spending and a current account surplus when the terms of trade deteriorate permanently. The model thus provides a counter example to the argument of Laursen and Metzler (1950) and Harberger (1950) that a permanent worsening in the terms of trade must produce a current account deficit.

## Taxation of Corporate Capital Income: Tax Revenues versus Tax Distortions

**Roger H. Gordon**
Working Paper No. 687
June 1981
JEL Nos. 323, 522

Since the average tax rate on corporate capital income is very high, economists often conclude that taxes have caused a substantial fall in corporate investment, a move-

ment of capital into noncorporate uses, and a fall in personal savings. The combined efficiency costs of these distortions are believed to be very important.

This paper attempts to show that when uncertainty and inflation are taken into account explicitly, taxation of corporate income leaves corporate investment incentives basically unaffected, in spite of the sizable tax revenues collected. In addition, in some plausible situations, such taxes can result in a gain in efficiency. The explanation for these surprising results is that the government, by taxing capital income, absorbs a certain fraction of both the expected return and the uncertainty in the return. While investors as a result receive a lower expected return, they also bear less risk when they invest, and these two effects are largely offsetting.

## Pitfalls in the Construction and Use of Effective Tax Rates

**David F. Bradford** and **Don Fullerton**
Working Paper No. 688
June 1981

A cost-of-capital formula can be a useful tool in estimating the effective tax rate on a dollar of marginal investment in a particular industry. There are a number of procedural issues, however, that can greatly affect the resulting estimates. First, tax rate estimates vary with the interest rate used in the formula. Second, the nonlinearity of tax rate formulas may lead to anomalous results. For example, an investment that is actually subsidized may appear to bear a positive tax. Or, tax rates may become arbitrarily large when the project's rate of return approaches zero. Third, effective tax rate results depend on the assumed relationship between inflation and nominal interest rates. Our conclusion is that much sensitivity analysis and specificity are required in studies that undertake to estimate effective tax rates.

## Tax Policy and Foreign Direct Investment

**David G. Hartman**
Working Paper No. 689
June 1981
JEL Nos. 323, 441, 442

This paper examines the impliclations of the most common system of taxing income from foreign sources. It is argued that because the repatriation of earnings to the home country investor, not the earnings themselves, are typically the source of tax liability, the tax on foreign source income should affect foreign investment differently depending on the required transfers of funds within the firm.

One implication of viewing the tax in this fashion is that in order to maximize aftertax profits, a firm should finance its foreign investment out of foreign earnings to the greatest extent possible. That is, a firm's required foreign return jumps at the point at which desired foreign investment just exhausts foreign earnings. This allows us to draw a distinction between "mature" foreign operations, which are at any point in time financed at the margin by reinvested earnings (and perhaps also pay dividends to their parent firm in the home country), and "immature" foreign affiliates, which rely on funding from their parents (and should not be paying dividends). It is noted that survey evidence on multinational firm behavior is consistent with this distinction. Direct investment data indicate that mature foreign operations probably account for nearly 90 percent of U.S. foreign direct investment.

The discussion then turns to investment incentives. It is shown that the home country's rate of tax on foreign source income and the presence or absence of a foreign tax credit should be irrelevant to a mature foreign operation's investment and dividend decisions. This conclusion, which conflicts sharply with the conventional wisdom, follows because the tax in the home country acts as an unavoidable cost. New firms' investment decisions are, on the other hand, influenced by home country taxes.

## Consumption Correlation and Risk Measurement in Economies with Nontraded Assets and Heterogeneous Information

**Sanford Grossman** and **Robert J. Shiller**
Working Paper No. 690
June 1981
JEL No. 313

Breeden's consumption beta theorem makes the expected return on any asset a function only of its covariance with changes in aggregate consumption. It is shown that the theorem is more robust than Breeden indicated. The theorem obtains even if one deletes Breeden's assumptions that (1) all risky assets are tradable, (2) investors have homogeneous beliefs, (3) other assets can be traded without transactions costs, and (4) all assets have returns that are Ito processes.

## A Systematic Banking Collapse in a Perfect Foresight World

**Robert P. Flood, Jr.** and **Peter M. Garber**
Working Paper No. 691
June 1981

In this paper we present a model in which a systematic banking collapse is possible in a perfect foresight, general equilibrium context. Our aim is to determine conditions under which a collapse could eventually occur and the timing of such a collapse. The collapse could occur endogenously, driven by market fundamentals. Alternatively, it could be caused by mass hysteria that, in reality, generates itself. We also compare the assumptions and implications of our model to the observable phenomena of the 1930s.

## Wealth Mobility: The Missing Element

**J. R. Kearl** and **Clayne L. Pope**
Working Paper No. 692
June 1981
JEL Nos. 042, 229

We consider the problems that may arise when cross-sectional data alone are used for inferences about individual welfare, the existence of elites, the possibilities of class boundaries, the openness of a society, and the like. We also consider problems with alternative measures of socioeconomic position. We then use a sample of 2400 households, observed over one- or two-decade intervals, together with data on the population of households at each observation point to examine mobility within the distribution of wealth for an almost closed economy: Utah from 1850 to 1870. We use information on households to examine those characteristics that contribute to mobility. We find considerable mobility, much apparently stochastic, within quite highly skewed distributions of wealth that also exhibit increasing inequality through time.

## Utilitarianism and Horizontal Equity: The Case for Random Taxation

**Joseph E. Stiglitz**
Working Paper No. 694
June 1981
JEL No.320

This paper establishes that the principle of horizontal equity may not be derived from utilitarianism and is actually inconsistent with utilitarianism in a variety of circumstances. I derive conditions under which: (1) it is optimal to impose random tax schedules (ex post randomization); and (2) it is optimal to randomize the tax schedules imposed on a set of otherwise identical individuals (ex ante randomization). I discuss the implications for optimal tax theory, more generally showing that there are a number of potentially important economic situations with which the principle of horizontal equity may be inconsistent not only with utilitarianism but also with Pareto optimality.

## Monetary Policy and Short-Term Interest Rates: An Efficient Markets-Rational Expectations Approach

**Frederic S. Mishkin**
Working Paper No. 693
June 1981
JEL Nos. 313, 311, 130

The impact of an increase in the money stock on nominal short-term interest rates has been a hotly debated issue in the literature of monetary economics. The most commonly held view—also a feature of most structural macro models—has an increase in the money stock leading, at least in the short run, to a decline in short interest rates. Monetarists dispute this view because they believe that it ignores the dynamic effects of an increase in the money stock.

This paper is an application of efficient markets-rational expectations theory to an empirical analysis of the relationship between money supply growth and short-term interest rates. This approach has the advantage over earlier research on this subject of imposing a theoretical structure that allows easier interpretation of the empirical results as well as more powerful statistical tests. In the interest of ascertaining the robustness of the results, many different empirical tests are carried out in this paper, and they uniformly *do not support* the proposition that increases in the money supply are correlated with declines in short rates.

## Familial Love and Intertemporal Optimality

**Herschel I. Grossman**
Working Paper No. 695
June 1981
JEL No. 024

This paper analyzes the intertemporal efficiency and optimality of steady states within overlapping generations models in which the utility of individual working couples depends on the consumption of their parents and children as well as their own consumption. The analysis considers both a basic model, in which altruistic behavior can take only the form of gifts of consumption goods from working couples to their retired parents, and an extended model in which altruistic behavior also can take the form of bequests from parents to their surviving children. In the basic model, saving involves only storing consumption goods, whereas the extended model includes capital and neoclassical production.

The following conclusions from the analysis apply to both models. An altruistic utility function promotes intertemporal efficiency. However, altruism creates an externality that implies that satisfying the conditions for efficiency does not ensure intertemporal optimality. Nevertheless, if the utility of working couples is appropriately sensitive at the margin to their own consumption, their parents' consumption, and their children's consumption, the steady state that is consistent with individual behavior is both efficient and optimal.

## Estimated Effects of Relative Prices on Trade Shares

**Ray C. Fair**
Working Paper No. 696
June 1981

This paper presents estimated effects of relative prices on trade shares for 64 countries. The equations use pooled, time-series, cross-section data assuming that the error term is serially correlated across time and heteroskedastic across countries. The results strongly indicate that relative prices have an important effect on trade shares.

I also examine the sensitivity of the properties of the multicountry model in Fair (1981a) to the endogenous treatment of trade shares. The addition of the trade share equations to the model has noticeable effects on those properties in giving the effects of a depreciation. In this version of the model, the sensitivity of trade shares to relative prices is an important channel through which a country's price of exports affects the demand for its exports.

## Taxation and Excess Burden: A Life-Cycle Perspective

**E. John Driffill** and **Harvey S. Rosen**
Working Paper No. 698
June 1981
JEL No. 323

A lifetime perspective is appropriate in assessing the welfare implications of government tax policies. Although a number of attempts have been made to examine the excess burden of taxation in life-cycle models, these have tended to ignore the role of human capital accumulation and/or the leisure-income choice. In this paper, we do numerical simulations with a model that takes both of these phenomena into account.

We find that under reasonable assumptions, the failure to take into account distortions of human capital decisions produces substantial underestimates of the excess burden of income taxation. In addition, allowing for the endogeneity of human capital increases the efficiency of a personal consumption tax relative to that of an equal yield income tax.

## Implications of the Changing U.S. Labor Market for Higher Education

**Richard B. Freeman**
Working Paper No. 697
June 1981
JEL No. 820

This paper examines evidence on the impact of the changed labor market on the higher educational system. Some basic propositions can be drawn from the paper's findings.

First, the labor market for the highly educated underwent a downturn in the 1970s, reducing the relative earnings of new college graduates and forcing them into jobs not normally considered as requiring college training. Second, this downturn resulted in a leveling off, and, in the case of white males, a sharp decline, in college enrollment. Statistical and survey questionnaire data show that this is due to the economic responsiveness of potential students to market incentives.

The effects of this labor market change were most severe in the liberal arts, teaching, and academic and research-oriented occupations. In other business-oriented fields such as management and accounting, and in engineering, economic opportunities remained substantial or in some cases improved. Consistent with these changes were changes in enrollments and degrees. Depressed job markets experienced rapid declines in enrollment, while fields such as engineering experienced an increase in enrollment. Concurrently, professional schools benefited while liberal arts schools suffered from labor market induced patterns of change in enrollment.

## Inflation, Resource Utilization, and Debt and Equity Returns

**Patric H. Hendershott**
Working Paper No. 699
June 1981
JEL No. 313

Enormously diverse real and nominal ex post returns on equity and short- and long-term debt securities have accompanied substantial variations in inflation and resource utilization during the past half-century. This paper examines the relationships among these security returns and analyzes the effects of inflation and resource utilization on the relationships.

The three major results are:

(I) Prior to the Treasury–Federal Reserve Accord in 1951, nominal yields on one-month Treasury bills were reasonably stable, while real bill rates were incredibly volatile. Since 1952 the reverse has been true. Nominal bill rates have cycled around a rising trend, and real bill rates have stayed near zero.

(2) Changes in yields on new-issue, long-term bonds have been largely unanticipated, and these changes have dominated the realized returns on bonds relative to Treasury bills. Because bond rates have risen with (unexpected) inflation during the last fifteen years, bonds have earned negative real returns.

(3) The relative returns on equities and bonds are greatly affected by the business cycle, with equities performing very well around troughs and very poorly around peaks. This has been true for all ten troughs since 1926 and all six peaks since 1946.

## Risk And Return: A New Look

**Burton G. Malkiel**
Working Paper No. 700
June 1981

One of the best-documented propositions in the field of finance is that, on average, investors have received higher rates of return on securities for bearing greater risk. This paper looks at the historical evidence regarding risk and return, explains the fundamentals of portfolio and asset-pricing theory, and then takes a new look at the relationship between risk and return using some unexplored risk measures that seem to capture quite closely the actual risks being valued in the market.

The paper concludes that the best single risk proxy is not the traditional beta calculation but rather the dispersion of analysts' forecasts. Companies for which there is broad consensus with respect to future earnings and dividends seem to be less risky (and hence have lower expected returns) than companies for which there is little agreement among security analysts. It is possible to interpret this result as contradicting modern asset-pricing theory, which suggests that total variability per se will not be relevant for valuation. As is shown in the paper, however, this dispersion of forecasts could well result from different companies being particularly susceptible to systematic risk elements and thus the dispersion measure may be the best individual proxy available to capture the variety of systematic risk elements to which securities are subject.

## Investment Strategy in an Inflationary Environment

**Zvi Bodie**
Working Paper No. 701
June 1981
JEL No. 520

This paper addresses the issue of how an investor concerned about the real rate of return on his investment portfolio should allocate his funds among four major asset classes: stocks, bonds, bills, and commodity futures contracts. It employs the Markowitz mean-variance framework to derive estimates of the pretax, real, risk-return trade-off curve currently facing an investor in the U.S. capital markets.

Some of the major findings are:

(1) Bills are the cornerstone of any low-risk investment strategy. The minimum-risk portfolio has a mean real rate of return of zero and a standard deviation of about 1 percent. The slope of the trade-off curve is initially one, but it declines rapidly as one progresses up the curve to higher mean rates of return.

(2) Stocks offer the highest mean and are also riskiest.

(3) Bonds play a prominent part in portfolios that lie in the midsection of the trade-off curve, although not much would be lost if these instruments were eliminated.

(4) Commodity futures contracts are the only asset whose returns are positively correlated with inflation. By adding them to the portfolios of stocks, bonds, and bills, it is possible to achieve any target mean real rate of return with less risk.

## Changing Balance Sheet Relationships in the U.S. Manufacturing Sector, 1926-77

**John H. Ciccolo, Jr.**
Working Paper No. 702
June 1981

This paper documents trends in the sources and uses of funds, market valuations, and rates of return for a sample of U.S. manufacturing firms during the half-century ending in 1977. The major objective of the paper is to construct economic balance sheet relationships based on securities market valuations rather than on the more familiar book values used for accounting purposes.

Among the more interesting long-term trends highlighted in the analysis is the finding that the widely recognized increase in debt in the capitalization of manufacturing firms has come primarily at the expense of preferred stock. A second interesting point is the contrast between the sharp fall in common equity values in 1929-32, which was entirely reversed by 1936, and the even sharper post-1968 decline, which was not reversed by 1977 nor, for that matter, by 1981.

This paper is an introduction to a more comprehensive study that will be part of the second stage of the Debt-Equity Research Project.

## Private Pensions as Corporate Debt

**Martin Feldstein**
Working Paper No. 703
June 1981
JEL No. 521

This paper begins by examining the ways in which pension liabilities are and are not like corporate bonds. Some conceptual issues involved in valuing future pension obligations are then discussed.

The second section considers the advantage to firms of fully funding their pension obligations and the reasons why many firms nevertheless choose to have unfunded obligations. The third section summarizes the results of research on the effect of unfunded pension liabilities on the equity value of firms.

The first three sections thus consider the role of pensions at the level of the individual firm. The two sections that follow focus on the current and future role of pensions in the national economy. More specifically, section four examines the effect of private pensions on the nation's saving rate, paying special attention to the impli-

cation of unfunded pension obligations. The fifth section discusses the impact of inflation on the private pension system and the likely future for indexed and unindexed private pensions.

## Debt and Economic Activity in the United States

**Benjamin M. Friedman**
Working Paper No. 704
June 1981

This paper documents a long-standing stability in the relationship between outstanding debt and economic activity in the United States and explores the implications for capital formation of several hypotheses that could explain this observed phenomenon.

The aggregate of outstanding credit liabilities of all nonfinancial borrowers in the United States bears as close a relationship to U.S. nonfinancial economic activity as do the more familiar asset aggregates such as the money stock (however measured) or the monetary base. This stability in the debt-to-income relationship reflects the net outcome of pronounced but offsetting movements of the public and private components of the total debt aggregate.

Three different hypotheses provide potential explanations for this phenomenon. Two of these, one emphasizing taxpayers' actions and one based on credit market borrowing constraints, carry the implication that increases in government outstanding debt associated with financing budget deficits crowd out private financing and hence private capital formation. The third hypothesis, which emphasizes the portfolio preferences of lenders, implies that increased government financing will not crowd out private capital formation but will cause the private sector to shift from debt to equity financing.

## Real and Monetary Disturbances in an Exchange-Rate Union

**Richard C. Marston**
Working Paper No. 705
June 1981
JEL No. 430

This paper investigates how a small country fares in an exchange-rate union if that country is subject to real and monetary disturbances originating at home and abroad. By joining a union the country can fix the exchange rate between its currency and the currency of another country or countries. The paper asks whether or not fixing this exchange rate helps to modify the effects of disturbances on the domestic economy.

This question is investigated within a model consisting of an aggregate demand equation dependent upon the terms of trade, an aggregate supply equation in which labor supply is responsive to the general price level, and a financial equation that determines the exchange rate of the domestic currency relative to one of two foreign currencies (the other being determined by triangular arbitrage). Aggregate supply behavior varies depending upon whether wages respond to prices with a lag or are indexed to current changes in the general price level. Because the small-country model cannot be used by itself to analyze the effects of foreign disturbances, the paper introduces models of two foreign countries with the same analytical structure as the domestic-country model. Foreign disturbances are studied in two stages, first within the foreign model, then within the domestic model.

The analysis shows that one of the most important factors determining the effects of the union is the degree of wage indexation in the domestic economy. The greater the degree of indexation, the less difference there is between output variation in the union and in a flexible regime. Apart from wage behavior, two other factors are important: the sources of the disturbances and the pattern of trade. Contrary to common belief, the case for a union is not necessarily strengthened if disturbances primarily originate outside the union and if the domestic country trades primarily with other members of the union.

## The Added-Worker Effect: A Reappraisal

**Shelly Lundberg**
Working Paper No. 706
July 1981
JEL No. 824

This paper interprets the "added-worker effect" as a response to uncertain returns to the labor supply offered by members of a household. I develop a model of household labor supply in which each member's current labor force status affects the job search and participation decisions of the other members of the household and thus the probabilities of observed transitions among the states of employment, unemployment, and nonparticipation. I then investigate the determinants of actual household transitions, using continuous employment histories for a sample of low-income families. Simulations using the estimated transition functions show that increased unemployment among married men has a sizable short-run effect on both participation and employment of married women.

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