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Program Report

Financial Markets and Monetary Economics

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The course taken by U.S. financial markets, and the implications of this course for the nation's economy, have been the focus of widespread concern during the two-and-a-half years since this *Reporter* last summarized the activities of NBER's Program of Research in Financial Markets and Monetary Economics (FMME).[1] At the most immediate level, interest rates and asset prices have experienced substantial variation during this period, with consequent effects on the pace of nonfinancial economic activity.

At the outset of 1982, nominal interest rates on both short and long-term debt instruments in the United States were still near their record highs, equity prices were severely depressed in comparison with previous values, and the U.S. economy had only recently entered a new business recession after the shortest economic recovery in six decades. By yearend, interest rates had fallen sharply, the equity markets had rallied, and the recession had reached its trough.

During the next year, most interest rates remained lower in nominal terms, although still at unprecedented levels in comparison to the economy's ongoing rate of price inflation, while the economy began what in time developed into a strong cyclical recovery. Most recently, as the economic expansion has gained momentum, interest rates have risen and equity prices faltered once again.

These financial developments and their real economic consequences have clearly not been independent of the extraordinary paths followed by U.S. fiscal and monetary policies during this period. Fiscal policy since yearend 1981 has entered uncharted territory in two respects. First, in the wake of the 1981–82 recession the federal government's expenditures have exceeded its revenues by a margin that was unprecedented in the nation's prior peacetime experience, and not just absolutely but in relation to the size of the economy. Second, the subsequent return to economic expansion has not significantly narrowed the budget gap, because the growing fundamental imbalance between federal expenditures and revenues on a full-employment basis has enlarged the deficit about as fast as the return toward full employment has narrowed it.

U.S. monetary policy has also undergone significant changes in orientation during the past two-and-a-half

[1] *That summary appeared in the Winter 1981/82 issue of the* NBER Reporter.

In This Issue

This issue of the *Reporter* highlights the Bureau's Program in Financial Markets and Monetary Economics. Next, Charles Clotfelter describes his work on federal taxes and charitable giving. Then, David Hartman discusses the interaction between tax policy and foreign investment. After the quarterly Economic Outlook Survey are biographical sketches, news of NBER conferences, the Conference Calendar, and other NBER news and reports. The *Reporter* concludes with short summaries of recent NBER Working Papers.

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years. At the beginning of 1982, the Federal Reserve System remained committed both to a "tight money" policy and, more generally, to a policy framework that placed central emphasis on achieving stated targeted growth rates for a few specific monetary aggregates. Later that year, however, the Federal Reserve publicly suspended what had been the most important among these monetary aggregate targets, permitting interest rate declines that would have been inconsistent with its following through with that policy orientation. Since then the Federal Reserve has continued, at least publicly, to formulate monetary policy in terms of growth targets for the major monetary aggregates (and, beginning last year, a new credit aggregate), but the actual role of such targets in the policy process has remained unclear.

These developments, whatever their ultimate implications for the nation's economic well-being, have proved exciting from a research perspective. Some members of the Bureau's FMME program have been quick to focus on them in their own research, investigating the working of monetary and fiscal policies as well as the effects of these policies on the pricing of financial assets and on nonfinancial economic activity. Even more research within the program has reflected the developments of the past two-and-a-half years more indirectly, taking advantage of the resulting extreme movements of interest rates and asset prices to gather fresh evidence with which to test either new or familiar hypotheses in the fields of monetary economics and finance. In all, these years have again been a highly active period for research within the program.

Fiscal Policy

Willem Buiter, Benjamin Friedman, Vance Roley, and Jeffrey Frankel have all done research on the economic implications of government deficits. Buiter's several papers in this subject examine the long-run aspects of the relationships connecting government deficits, private sector wealth, private investment, and inflation.[2] In one paper, based on a comprehensive permanent income accounting framework, Buiter argues that the conventionally measured government financial surplus is a misleading guide to the changing net worth of the public sector. He then goes on to analyze general rules for policies to facilitate government smoothing of expenditures by minimizing capital market imperfections. In two other papers, Buiter argues in favor of analyzing fiscal policy by an inflation-and-real-growth-corrected, cyclically adjusted government current account deficit.

Friedman's papers focus on more medium-run implications of government deficits for private investment

[2] *W. H. Buiter, "Comment of T. J. Sargent and N. Wallace: 'Some Unpleasant Monetarist Arithmetic,'" NBER Working Paper No. 867, March 1982; "Measurement of the Public Sector Deficit and Its Implications for Policy Evaluation and Design," NBER Reprint No. 426, June 1983; and "Deficits, Crowding Out, and Inflation: The Simple Analytics," NBER Working Paper No. 1078, February 1983.*

through induced movements in interest rates.[3] In one empirical study for the United States, Friedman concludes that explicitly allowing for government financing of budgets sharply reduces standard estimates of the real-sector effects of fiscal policy actions. In another paper Friedman concludes that the unprecedented peacetime rise in the 1980s in the ratio of the U.S. government's outstanding debt in relation to the economy's gross national product has negative implications for the financing of U.S. capital formation. He argues that public and private sector debt ratios have historically tended to move inversely.

Roley's work and Frankel's focus in turn on the way in which the substitutability of different assets in the public's aggregate financial portfolio affects this "crowding out" of private investment by government deficits.[4] Roley uses a disaggregated asset demand model to analyze the relevant substitutabilities among U.S. government securities, bonds issued by business corporations, and corporate equities. He then examines the resulting implications for crowding out by debt-financed government deficits. By contrast, Frankel uses a different empirical technique to derive estimates of the relevant substitutabilities, suggesting that this crowding out effect is likely to be small or even negative.

Monetary Policy

Bennett McCallum and Friedman have both done research analyzing the merits and drawbacks of the new monetary policy orientation and procedures announced in 1979.[5] McCallum concludes that the experience since 1979 does not constitute a "monetarist experiment" but goes on to argue that, in any case, a moderately activist policy approach focused on the monetary base would be likely to produce better results than a policy of inflexibly controlling the growth of monetary aggregates. Friedman is more prepared to consider this experience a distinct policy experiment but likewise highlights its drawbacks. In one of Friedman's papers he emphasizes the costs of the resulting increase in interest rate volatility, while in another he argues in more general terms that the evidence from this period had contradicted a series of familiar propositions often used to rationalize the use of monetary aggregate targets for monetary policy.

Carl Walsh, Zvi Bodie, Alex Kane, Robert McDonald, Friedman, and Richard Clarida have all done research that reaches quite consistent conclusions about the effect of the post-1979 monetary policy on interest rates.[6] Walsh argues on theoretical grounds that the Federal Reserve's new operating procedures could have shifted the nature of the public's demand for money balances in such a way as to account for part of the subsequent very large increase in interest rate volatility. In an empirical study, Bodie, Kane, and McDonald conclude that the increased volatility of long-term interest rates in turn raised the required risk premiums in long-term bonds. In another empirical study, Friedman and Clarida conclude that the slowing of money supply growth after 1979, in conjunction with continuing price inflation, largely explains the high level of short-term interest rates since then.

McCallum, Friedman, Michael Bordo, Anna Schwartz, and Robert Lucas have all worked on more general aspects of the problems of carrying out monetary policy.[7] In one of his two papers in this area, McCallum argues that a policy of pegging an interest rate, as an alternative to setting a monetary aggregate growth rate, would not necessarily lead to the problems of price level indeterminacy that are sometimes associated with it. In his other paper, McCallum compares the interest rate and the reserve base as instruments for controlling monetary aggregates. He concludes that an interest rate instrument will always give better monetary control under lagged reserve accounting but that, for a wide range of values of the relevant behavioral parameters, a reserve instrument will give better monetary control under contemporaneous reserve accounting. Friedman's two papers in this area both address the idea of using a credit target for monetary policy. In one paper, Friedman concludes that evidence for the United States was as favorable to a credit target as a monetary target, on several important criteria; in the other, he reports mixed results from an analysis of comparable evidence for several different countries.

[3] *B. M. Friedman, "Interest Rate Implications for Fiscal and Monetary Policies: A Postscript on the Government Budget Constraint," NBER Reprint No. 328, November 1982; and "Managing the U.S. Government Deficit in the 1980s," NBER Working Paper No. 1209, October 1983.*

[4] *V. V. Roley, "Asset Substitutability and the Impact of Federal Deficits," NBER Working Paper No. 1082, February 1983; and J. A. Frankel, "A Test of Portfolio Crowding Out and Related Issues in Finance," NBER Working Paper No. 1205, September 1983.*

[5] *B. T. McCallum, "Monetarist Rules in the Light of Recent Experience," NBER Working Paper No. 1277, February 1984; B. M. Friedman, "Federal Reserve Policy, Interest Rate Volatility, and the U.S. Capital Raising Mechanism," NBER Reprint No. 431, November 1982; and "Lessons from the 1979-82 Monetary Policy Experiment," NBER Working Paper No. 1272, February 1984.*

[6] *C. E. Walsh, "Interest Rate Volatility and Monetary Policy," NBER Working Paper No. 915, June 1982; Z. Bodie, A. Kane, and R. L. McDonald, "Why Are Real Interest Rates So High?" NBER Working Paper No. 1141, June 1983; and R. Clarida and B. M. Friedman, "The Behavior of U.S. Short-Term Interest Rates since October 1979," NBER Working Paper No. 1273, February 1984.*

[7] *B. T. McCallum, "Some Issues Concerning Interest Rate Pegging, Price Level Determinacy, and the Real Bills Doctrine," NBER Working Paper No. 1294, March 1984; B. T. McCallum and J. G. Hoehn, "Money Stock Control with Reserve and Interest Rate Instruments under Rational Expectations," NBER Working Paper No. 893, May 1982; B. M. Friedman, "Monetary Policy with a Credit Aggregate Target," NBER Reprint No. 434, December 1983; and "Money, Credit, and Nonfinancial Economic Activity: An Empirical Study of Five Countries," NBER Working Paper No. 1033, November 1982; M. D. Bordo, E. V. Choudhri, and A. J. Schwartz, "Monetary Interdependence under Managed Floating Exchange Rates and the Outcome of the Monetary Authority Practices: The Case of Canadian Money Growth Control through an Interest Rate Policy Instrument"; and R. F. Lucas, "Financial Innovation and the Control of Monetary Aggregates: Some Evidence from Canada," NBER Working Paper No. 1157, June 1983.*

Bordo and Schwartz analyze the experience of monetary control in Canada during the floating exchange rate period since 1970 and argue that the use of an interest rate instrument leads to monetary interdependence because of responses both by the central bank and by the nonbank public. Lucas concludes, also on the basis of Canadian evidence, that central bank efforts to control a monetary aggregate will induce an increase in its velocity—that is, will decrease the demand for that aggregate in relation to income.

In a related area, Edward Kane has worked on aspects of policies for regulating financial markets.[8] In one paper Kane analyzes the competition among different regulatory agencies for authority over innovative financial instruments, arguing that the interaction between governmental regulatory agencies and self-regulatory cooperatives produces more efficient regulatory structures than would either alone. In another paper Kane argues that financial firms restructure their organizations to lower the net burdens resulting from government regulation.

Effects of Money Stock Announcements

One perhaps unintended side effect of the increased emphasis placed on monetary aggregates in the post-1979 U.S. monetary policy process has been the greatly increased attention paid by financial market participants to the Federal Reserve's weekly release of data on the monetary aggregates. This development has prompted several members of the Bureau's FMME program to investigate the market effects of such announcements.

In a series of papers, Roley and Walsh examine the effects of these announcements both on interest rates and on equity prices.[9] First, Roley shows that the response of short-term interest rates to these announcements increased significantly after October 1979. He goes on to argue that this effect, together with the increased volatility of money growth during this period, contributed to the post-1979 increase in interest rate volatility. In two further papers Roley and Walsh examine the associated responses of both short and long-term interest rates; they conclude that these responses were consistent with the effects of money stock announcements on market participants' anticipations of future Federal Reserve policy actions, rather than with effects on anticipations of future price inflation. Roley also examines the analogous response of equity prices in two additional papers, concluding that equity prices had become more sensitive to money stock announcements after October 1979, and that there was little if any parallel effect from announcements of data on price inflation on real economic growth.

Paul Wachtel, Frankel, and John Makin also investigated this new market development.[10] In two papers, Wachtel first shows that the structure of prior expectations of the weekly money stock data is inconsistent with often expectational "rationality" properties. He also concludes that both money stock announcements and announcements of the producers' price index (but not the consumer price index) have immediate effects on interest rates. Frankel extends this analysis and finds further support for the policy anticipations hypothesis, by reporting analogous effects of money stock announcements on the prices of publicly traded commodities. Makin argues that differences among some other earlier authors' findings about the effects of money stock announcements on interest rates had reflected their use of interest rate data measured over differing time intervals.

Interest Rates and Asset Prices

Effects of fiscal and monetary policies and money stock announcements have hardly been the only aspect of the determination of interest rates and asset prices that members of the FMME program have studied during this period. Interest rates and asset prices have always attracted the attention of economists, and probably they always will. Especially in light of the unusually large movements in both, thus far during the 1980s, several different aspects of this subject have been lively areas of research.

At the most fundamental level, Gary Chamberlain, Michael Rothschild, Frankel, and Robert Pindyck all have studied the implications of how markets for financial assets price risk. Lawrence Summers and Alex Kane both address aspects of the key question of whether financial asset markets are "efficient" in the usual sense precluding systematic profit opportunities.[11]

[8] *E. J. Kane, "Technological and Regulatory Forces in the Developing Fusion of Financial Services Competition," NBER Working Paper No. 1320, April 1984; and "Regulatory Structure in Futures Markets: Jurisdictional Competition among the SEC, the CFTC, and Other Agencies," NBER Working Paper No. 1331, April 1984.*

[9] *V. V. Roley, "The Response of Short-Term Interest Rates to Weekly Money Announcements," NBER Reprint No. 437, January 1984; V. V. Roley and C. E. Walsh, "Monetary Policy Regimes, Expected Inflation, and the Response of Interest Rates to Money Announcements," NBER Working Paper No. 1181, August 1983; and "Unanticipated Money and Interest Rates," NBER Working Paper No. 1278, February 1984; D. K. Pearce and V. V. Roley, "The Reaction of Stock Prices to Unanticipated Changes in Money: A Note," NBER Reprint No. 460, March 1984; and "Stock Prices and Economic News," NBER Working Paper No. 1296, March 1984.*

[10] *T. Urich and P. Wachtel, "The Structure of Expectations of the Weekly Money Supply Announcement," NBER Working Paper No. 1090, March 1983; and "The Effects of Inflation and Money Supply Announcements on Interest Rates," NBER Working Paper No. 1313, March 1984; J. A. Frankel and G. A. Hardouvelis, "Commodity Prices, Overshooting, Money Surprises, and Fed Credibility," NBER Working Paper No. 1121, May 1983; and J. H. Makin, "Money Surprises and Short-Term Interest Rates: Reconciling Contradictory Findings," NBER Working Paper No. 993, September 1982.*

[11] *G. Chamberlain and M. Rothschild, "Arbitrage, Factor Structure, and Mean-Variance Analysis of Large Asset Markets," NBER Reprint No. 446, February 1984; J. A. Frankel and W. T. Dickens, "Are Asset Demand Functions Determined by CAPM?" NBER Working Paper No. 1113, May 1983; R. S. Pindyck, "Risk, Inflation, and the Stock Market," NBER Working Paper No. 1186, August 1983; L. H. Summers, "Do We Really Know That Financial Markets Are Efficient?" NBER Working Paper No. 994, September 1982; and A. Kane and Y. K. Lee, "The Forecasting Ability of Money Market Fund Managers and Its Economic Value," NBER Working Paper No. 1243, December 1983.*

Chamberlain and Rothschild examine the implications of arbitrage in a market with many assets and determine under what conditions such a market permits so much diversification as to make available risk-free investment opportunities. Frankel uses a new empirical technique to provide evidence inconsistent with the familiar capital asset pricing model, which relates the responsiveness of asset demands in a specific way to the systematic joint variation of asset returns. Pindyck argues that the decline in the equity markets in 1981–82 was the result of the increase in the relative riskiness of investors' returns on equity, associated with higher variance of firms' real gross marginal return on capital.

Summers argues that, for speculative markets in long-lived assets such as bonds and equities, the statistical tests commonly used to examine efficiency are very weak, so that the failure of these tests to show significant inefficiencies in fact provides little evidence that such markets actually are efficient. Kane examines evidence from money market funds and concludes that, while a small fraction of the funds exhibited superior market forecasting skills, those skills generated only negligible economic value.

Makin, Patric Hendershott, and Robert Shiller all did research on the implications in this context of price inflation and other aspects of macroeconomic activity.[12] In one paper Makin finds evidence supporting the hypothesis that uncertainty about inflation affects interest rate levels. He argues that this relationship renders the usual notion of "real" interest rates economically not meaningful. In another paper, however, Makin reports negative results for such effects of inflation uncertainty, relating interest rate movements instead to such factors as fiscal deficits, shifts in both money demand and money supply, and changes in tax rates.

Hendershott finds that changes in Treasury bill rates are systematically related to expected bill rate changes and to unanticipated changes in expected inflation, in inflation uncertainty, in nonfinancial economic activity, and in the growth of the monetary base. Shiller uses the observed movements of prices for bonds, equities, short-term debt, and nonfinancial assets to investigate the potential promise of models relating changes in long-term asset prices to consumption-related changes in discount rates associated with consumers' willingness to substitute between consumption at different times.

David Jones, Roley, Shiller, Gregory Mankiw, and Summers also did empirical studies of another familiar aspect of interest rate behavior: the extent to which rational expectations of future short-term rates alone can fully account for the behavior of long-term rates.[13] Jones and Roley test several versions of this model for the relationship between three-month and six-month Treasury bill rates and find evidence of a time-varying term premium in the longer-term rate. Shiller also rejects the expectations hypothesis, likewise arguing that independent movement of long-term rates is primarily responsible for the failure of the hypothesis. Mankiw and Summers too report evidence decisively rejecting the traditional expectations hypothesis, concluding that most variations in the yield curve reflect change in liquidity premiums rather than expected changes in interest rates.

Taxes and other institutional aspects of financial markets also figure prominently in many approaches to interest rate and asset pricing behavior, and several researchers did work along these lines. George Constantinides, Jess Yawitz, James Wilcox, Arturo Estrella, and Jeffrey Fuhrer investigated various aspects of the influence of taxes.[14] In one paper, Constantinides tests and rejects the hypothesis that tax trading explains the familiar phenomenon of abnormal January returns associated with shares in small firms. In another paper Constantinides argues that, because of tax considerations, optimal bond trading behavior differs substantially from a buy-and-hold strategy, even in the presence of transactions costs.

Yawitz develops an approach to explaining yield spreads on different kinds of bonds based on factors reflecting both tax ability and default risk differences. Wilcox extends a standard macromodel to include tax rates (as well as other elements, such as supply shocks) and finds that this extension substantially reduced the instability of the implied equations for interest rates. Estrella and Fuhrer derive time series for the average marginal tax rates paid by U.S. households on income from dividends and from interest, respectively.

Yawitz, Wilcox, Hendershott, and Takatoshi Ito also examined the implications in this context of institu-

[12] *R. Hartman and J. H. Makin, "Inflation Uncertainty and Interest Rates: Theory and Empirical Tests," NBER Working Paper No. 906, June 1982; J. H. Makin and V. Tanzi, "The Level and Volatility of Interest Rates in the United States: The Roles of Expected Inflation, Real Rates, and Taxes," NBER Working Paper No. 1167, July 1983; P. H. Hendershott, "Expectations, Surprises, and Treasury Bill Rates: 1960–82," NBER Working Paper No. 1268, January 1984; and R. J. Shiller, "Consumption, Asset Markets, and Macroeconomic Fluctuations," NBER Working Paper No. 838, January 1982.*

[13] *D. S. Jones and V. V. Roley, "Rational Expectations and the Expectations Model of the Term Structure: A Test Using Weekly Data," NBER Reprint No. 461, March 1984; J. Y. Campbell and R. J. Shiller, "A Simple Account of the Behavior of Long-Term Interest Rates," NBER Working Paper No. 1203, September 1983; and N. G. Mankiw and L. H. Summers, "Do Long-Term Interest Rates Overreact to Short-Term Interest Rates?" NBER Working Paper No. 1345, May 1984.*

[14] *G. M. Constantinides, "Optimal Stock Trading with Personal Taxes: Implications for Prices and the Abnormal January Returns," NBER Working Paper No. 1176, August 1983; G. M. Constantinides and J. E. Ingersoll, Jr., "Optimal Bond Trading with Personal Taxes: Implications for Bond Prices and Estimated Tax Brackets and Yield Curves," NBER Working Paper No. 1184, August 1983; J. B. Yawitz, K. J. Maloney, and L. H. Ederington, "Taxes, Default Risk, and Yield Spreads," NBER Working Paper No. 1215, October 1983; J. Peek and J. A. Wilcox, "The Postwar Stability of the Fisher Effect"; and A. Estrella and J. C. Fuhrer, "Average Marginal Tax Rates for U.S. Household Interest and Dividend Income, 1954–80," NBER Working Paper No. 1201, September 1983.*

tional arrangements other than taxes.[15] Yawitz studies the risk structure of interest rates and concludes from an empirical analysis that yields on industrial and commercial bonds are related not just to the bonds' agency ratings but, in addition, to such readily available accounting measures of risk as leverage and interest coverage. Wilcox finds empirical evidence suggesting that interest rate behavior changes by statistically significant and economically meaningful amounts in response to changes in such factors as financial regulations and the framework characterizing monetary policy.

Hendershott studies households' decisions on whether to refinance home mortgages, developing models with implications for the relationship between movements in mortgage yields and changes in yields on the asset portfolios of mortgage lending institutions. Ito studies the effects of Japanese capital controls on the arbitrage relationship between Japanese and U.S. short-term interest rates and determines that covered interest parity has held since 1980, when a new law took force, but did not hold before then.

Corporate Capital Structures

The largest single project underway within the FMME program in recent years has been the study of "The Changing Role of Debt and Equity in Financing U.S. Capital Formation," sponsored by the American Council on Life Insurance. In recent years, questions about U.S. capital formation have increasingly become an area of both public and private concern. Such questions inevitably focus largely on the economy's corporate sector. Since World War II, corporations have consistently accounted for about three-quarters of all investment in plant and equipment in the United States. As a result, corporate behavior—including corporations' decisions about physical investment and their corresponding financial decisions—constitutes a primary determinant of the economy's overall capital formation process and performance. The first group of studies sponsored under this project, which were published individually and summarized in a 1982 NBER volume, addressed several key issues relevant to behavior of the corporate sector, along with such other aspects of the evolving financial underpinnings of U.S. capital formation as household saving incentives, international capital flows, and government debt management.[16]

The project's second series of studies, presented at a Bureau conference held in Palm Beach, Florida, in January 1983, focused in particular on the financial side of capital formation undertaken by the U.S. corporate business sector. At the same time, because corporations' securities must be held, these studies took as a parallel focus the behavior of the markets that price these claims. This emphasis on the corporate sector and on the financial environment that it confronts is valuable, not only because of corporations' large role in undertaking the economy's capital formation but also because the context of the corporate sector itself helps to define more sharply, and render more operational for purposes of empirical research, key elements of the debt and equity financing process.

The ten studies presented at this conference, together with the respective discussants' commentaries, will be published soon in an NBER volume.[17] In the lead study, Robert Taggart sets the stage for the entire series of papers by developing a conceptual framework for thinking about changes in corporate capital structures and by assembling and analyzing relevant time-series data going back in many cases to the beginning of the twentieth century. John Ciccolo and Christopher Baum take a closer look at an important slice of the corporate sector's capital structure, on the basis of new data series developed as part of this project and now available to other researchers. Hendershott and Roger Huang provide a parallel review and analysis of the market prices (yields) that U.S. corporations have faced in deciding on their capital structures.

Against the background of this general review of the experience of both the quantities and the prices associated with changes in corporate capital structures in the United States, the next four papers presented at the conference addressed more directly the market mechanism determining the prices (yields) of debt and equity securities. Of the four, two focus on general aspects of the behavior of investors in debt and equity securities, while two examine the market pricing mechanism in contexts specifically related to actual or potential changes in corporate capital structures. Bodie,

[15] *L. H. Ederington, J. B. Yawitz, and B. E. Roberts, "The Informational Content of Bond Ratings," NBER Working Paper No. 1323, April 1984; J. Peek and J. A. Wilcox, "The Reaction of Reduced-Form Coefficients to Regime Changes: The Case of Interest Rates," NBER Working Paper No. 1379, June 1984; P. H. Hendershott, S. C. Hu, and K. E. Villani, "The Economics of Mortgage Terminations: Implications for Mortgage Lenders and Mortgage Terms," NBER Reprint No. 432, December 1983; and T. Ito, "Capital Controls and Covered Interest Parity," NBER Working Paper No. 1187, August 1983.*

[16] *B. M. Friedman, ed.,* The Changing Roles of Debt and Equity in Financing U.S. Capital Formation. *Chicago: University of Chicago Press, 1982.*

[17] *B. M. Friedman, ed.,* Corporate Capital Structures in the United States. *Chicago: University of Chicago Press, forthcoming. The ten studies to be included are: R. A. Taggart, Jr., "Secular Patterns in Corporate Finance," NBER Working Paper No. 810, December 1981; J. H. Ciccolo, Jr., and C. F. Baum, "Changes in the Balance Sheet of the U.S. Manufacturing Sector, 1926-77," NBER Working Paper No. 1169, July 1983; P. H. Hendershott and R. D. Huang, "Debt and Equity Yields: 1926-80," NBER Working Paper No. 1142, June 1983; Z. Bodie, A. Kane, and R. L. McDonald, "Inflation and the Role of Bonds in Investor Portfolios," NBER Working Paper No. 1091, March 1983; B. M. Friedman, "The Substitutability of Debt and Equity Securities," NBER Working Paper No. 1130, May 1983; E. P. Jones, S. P. Mason, and E. Rosenfeld, "Contingent Claims Valuation of Corporate Liabilities: Theory and Empirical Tests," NBER Working Paper No. 1143, June 1983; W. H. Mikkelson, "Capital Structure Change and Decreases in Stockholders' Wealth: A Cross-Sectional Study of Convertible Security Calls," NBER Working Paper No. 1137, June 1983; A. J. Auerbach, "Real Determinants of Corporate Leverage," NBER Working Paper No. 1151, June 1983; M. S. Long and I. B. Malitz, "Investment Patterns and Financial Leverage," NBER Working Paper No. 1145, June 1983; and M. Spence, "Capital Structure and the Corporation's Product Market Environment."*

Alex Kane, and McDonald explore both theoretically and empirically the role of nominal (that is, not indexed) bonds of various maturities in the portfolios of U.S. investors. Friedman investigates empirically the degree of substitutability between debt and equity securities in the United States. Philip Jones, Scott Mason, and Eric Rosenfeld investigate how the financial markets, encumbered by numerous covenants and indenture provisions, value the complicated securities that U.S. corporations typically issue. Wayne Mikkelson examines the financial markets' pricing of corporate securities in the specific context of the changes in common stock values that occur when firms call outstanding convertible debt or preferred stock.

The last three papers presented at the conference directly examine the observed capital structures of U.S. corporations, emphasizing in particular the question of the relationship (if any) of capital structure decisions to corporations' real-sector behavior. Alan Auerbach focuses on one of the key factors underlying several familiar theories of optimal corporate capital structures: the role of taxes. Michael Long and Ileen Malitz focus on another of the major elements underlying familiar theories of corporate capital structures: the role of investment opportunities. Finally, Michael Spence examines the question of a relationship between corporations' real and financial behavior from a different perspective, arguing that, if choosing an optimal capital structure is a way for a corporation to reduce its costs in some relevant sense, then corporations facing greater competitive pressure in their product markets will have a greater incentive, and hence a greater tendency, to do so than will corporations enjoying more sheltered competitive environments.

Several of these researchers will also present nontechnical summaries of their findings at an NBER conference to be held in Williamsburg, Virginia, on September 20–21, 1984. That follow-up conference will provide an opportunity to share these findings with, and receive reactions from, an audience consisting primarily of chief financial officers of nonfinancial corporations and senior executive officers of major financial firms. The nontechnical summaries will in turn appear in a future NBER conference volume.

Other Issues in Corporate Finance

In addition to the research undertaken in conjunction with the conference on corporate capital structures, some of the same researchers, as well as other members of the FMME program, have investigated aspects of corporate finance and investment. Taggart, Alex Kane, McDonald, and Friedman all studied aspects of corporations' financial decisions.[18] In one paper, Taggart argues that regulated public utility companies not only adapt their financing decisions to the environment given by the relevant regulatory process but also use strategic financial behavior to influence regulated prices. In another paper Taggart identifies conditions under which either a pricing or a rationing system would be the better way for multidivision firms to allocate capital funds among its divisions and argues that actual capital budgeting in many firms reflects a mixture of both systems.

Kane and McDonald conclude that, given the value of the tax advantage to debt, variations in the magnitude of bankruptcy costs across firms cannot account for the simultaneous existence of both levered and unlevered firms, so that other approaches to explaining observed capital structure are needed. Friedman examines individual company data on pension funding and pension asset allocation and concludes that, although corporations do not manage the pension plans that they sponsor as if these plans were unrelated to the corporation, the evident relationships are not consistent with familiar theories of the pension aspects of corporate finance.

In addition, Yawitz, McDonald, and Daniel Siegel studied aspects of the implications of risk for corporations' nonfinancial decisions.[19] In one paper Yawitz concludes that conglomerate firms act as if their goals include reduction of profit volatility by within-firm diversification of income sources. In another paper Yawitz argues that uncertainty affects not only the corporate financial decisions more commonly related to risk but also firms' choices over their mix of production inputs. McDonald and Siegel examine the optimal timing of investment in irreversible projects and find that, because of the irreversibility factor, under reasonable parameter values it may be optimal to wait until the benefits projected to accrue from the project equal twice its investment cost.

Alex Kane and McDonald also studied how investors react to the information provided by corporations in the form of earnings and dividend announcements.[20] On the basis of an empirical analysis of stock return responses to contemporaneous earnings and dividend announcements, they conclude that investors do not evaluate these two pieces of information as if they were independent but instead give more credence to unanticipated dividend movements when earnings are likewise different from prior expectations.

[18] *R. A. Taggart, Jr., "Effects of Regulation on Utility Planning: Theory and Evidence," NBER Working Paper No. 866, March 1982, and "Capital Allocation in Multidivision Firms: Hurdle Rates versus Budgets," NBER Working Paper No. 1213, October 1983; A. Kane, A. J. Marcus, and R. L. McDonald, "How Big Is the Tax Advantage to Debt?" NBER Working Paper No. 1286, March 1984; and B. M. Friedman, "Pension Funding, Pension Asset Allocation, and Corporate Finance: Evidence from Individual Company Data," NBER Working Paper No. 957, August 1982.*

[19] *W. J. Marshall, J. B. Yawitz, and E. Greenberg, "Incentives for Diversification and the Structure of the Conglomerate Firm," NBER Working Paper No. 1280, February 1984; K. J. Maloney, W. J. Marshall, and J. B. Yawitz, "The Effect of Risk on the Firm's Optimal Capital Stock: A Note," NBER Working Paper No. 1132, May 1983; and R. L. McDonald and D. Siegel, "The Value of Waiting to Invest," NBER Working Paper No. 1019, November 1982.*

[20] *A. Kane, Y. K. Lee, and A. J. Marcus, "Earnings and Dividend Announcements: Is There a Corroboration Effect?" NBER Working Paper No. 1248, December 1983.*

Macroeconomic Behavior

Finally, several members of the FMME program, including Roger Waud, Sanford Grossman, Mervyn King, and Friedman all did research on aspects of economic behavior that are more directly macroeconomic.[21] In one paper Waud concludes that both supply shocks and effects of the variability of inflation had importantly influenced the relation between price inflation and real economic growth in the United States, while more classically oriented influences had been less important. In another paper Waud concludes that the same two factors had also explained much of the deterioration over the past quarter-century in the U.K. output-inflation trade-off.

Grossman analyzes the effects of shocks to relative demands and to production technology in a world with optimal labor contracts. He argues that, under conditions involving asymmetric information among industries about technology shocks, even a fully observed shock to relative demand would cause aggregate unemployment to fall. King analyzes recent contributions to the theory of household saving behavior, together with empirical evidence on the subject, focusing in particular on the conditions required for the familiar "life-cycle" representation of household consumption plans to be applicable. Last, Friedman argues that the experience of costly disinflation in the early 1980s contradicted the central policy promise of the new classical macroeconomics just as sharply as the experience of accelerating inflation in the 1970s contradicted the chief promise of earlier thinking.

[21] *R. T. Froyen and R. N. Waud, "Demand Variability, Supply Shocks, and the Output-Inflation Trade-Off," NBER Working Paper No. 1081, February 1983, and "The Changing Relationship between Aggregate Price and Output: The British Experience," NBER Working Paper No. 1134, June 1983; S. J. Grossman, O. Hart, and E. Maskin, "Unemployment with Observable Aggregate Shocks," NBER Working Paper No. 975, September 1982; M. A. King, "The Economics of Saving," NBER Working Paper No. 1247, December 1983; and B. M. Friedman, "Recent Perspectives in and on Macroeconomics," NBER Working Paper No. 1208, September 1983.*

Federal Tax Policy and Charitable Giving*

Charles T. Clotfelter

In answer to a question about the possible effects of eliminating the charitable deduction in the nation's income tax, Ronald Reagan replied that Americans "are the most generous people on earth" and that they would remain so without a deduction (*Wall Street Journal*, July 7, 1982, p. 4). The question was prompted by one of several major proposals for reforming the U.S. tax system: a low-rate comprehensive income tax. Indeed, concern over economic incentives, the effects of inflation, tax compliance, and distributional equity appears to have reached a new level in the United States. From 1976 to 1983 an average of one major tax bill was enacted every two years and mounting discussion of comprehensive tax reform continues. As the question to the president suggests, one source of concern amid these actual and potential tax changes is the effect that they will have on charitable giving. This may be a particularly important topic now, following recent cuts in federal social welfare expenditures. In fact, the philanthropic sector has long shown a keen interest in tax provisions affecting their support and operation.

The project from which this article is drawn concerns the relationship between federal taxes and charitable giving. Its objective is to present and discuss statistical evidence on this relationship in order to assist in the evaluation of tax policy. Econometric analysis has focused on four major areas of charitable behavior: individual contributions, volunteering, corporate giving, and charitable bequests. There is also some empirical evidence on the effect of taxes on foundations, but no econometric studies have been done in that area. The bulk of econometric analysis and attention in economic studies has been directed toward individual giving, which seems appropriate since a large share of total gifts is accounted for by individuals. Contributions by individuals vary widely by income level and age as well as among individuals within those classifications. The major tax policy instrument affecting individual giving is the charitable deduction allowed in

* *This article is derived from the introductory chapter of* Federal Tax Policy and Charitable Giving *by Charles T. Clotfelter, an NBER monograph forthcoming from the University of Chicago Press.*

the calculation of taxable income for taxpayers who itemize their deductions. As a result of this tax treatment, there are two major tax effects on individual giving: the tax liability affects the aftertax income from which taxpayers can make contributions, and the deduction reduces the net price per dollar of the contribution made. The econometric analysis of individual giving implies that the income tax has a strong effect on giving. This is not to say, however, that taxes are the only or the major influence on individual contributions, but they are one significant factor.

Taken as a whole, the empirical work on tax effects and individual giving is notable for the number and variety of studies in the area and the consistency of the findings. In few other applied areas in public finance has there been such extensive replication of empirical findings using different data sets. Studies of charitable contributions have used aggregated and individual data, data from tax returns and survey data, and foreign as well as U.S. experience. The consensus of these studies is that the price elasticity for the population of taxpayers is probably greater than one in actual value, although there are certainly estimates that are smaller or considerably larger than this. The range of most likely values appears to be about -0.9 to -1.4. That is, a 10 percent increase in the price of contributions, through a change making the charitable deduction less attractive, would result in a 9 to 14 percent cut in contributions. Taxes also influence giving through an income effect, with most estimates of the income elasticity falling between 0.6 and 0.9. In other words, a tax-induced increase in income of 10 percent tends to increase contributions by 6 to 9 percent.

In order to appreciate the implications of these findings, it is necessary to consider the specific hypotheses, different uses of data, and qualifications that apply to the studies themselves. For example, one hypothesis is that itemization status and marginal tax rate work together through the price effect to affect giving and that there is no separate "itemization effect." Separate tests of such an effect, in fact, confirm this hypothesis. Another important question is whether the price elasticity varies by income level. The extensive analysis on this question has failed to provide a definitive answer, but it appears that the elasticity rises in absolute value with income. It is reasonable to conclude, however, that the price elasticity is significantly less than zero even for low-income taxpayers. A question of particular importance for evaluating the impact of tax policy is whether taxpayers respond immediately to changes in price and income. Evidence on this questions suggests that there are substantial lags in giving behavior, with the result that short-run responses are much less comprehensive than those in the long run. One other question related to the impact of fiscal policy on contributions is whether increased government spending "crowds out" private giving. The econometric evidence on this question shows little if any effect of this sort in spite of the apparent relationship observed among nations in the size of government and the strength of private giving. Throughout this empirical literature certain econometric issues have had to be dealt with, in particular the high correlation between price and income. Based on attempts to correct for possible biases as well as for the variety of data and models used in these studies, it appears that these econometric problems are not a major factor in explaining the pattern of estimates.

Along with individual contributions, volunteering is one of the two major sources of private support for the charitable sector. In contrast to individual giving, however, our knowledge about the tax effects on volunteering is quite limited. For one thing, data on volunteering are sparse, and data linking volunteering to tax variables are even more limited. In theory, income taxation can have two broad effects on volunteering: a direct effect through the influence of tax rates on the allocation of time and an indirect effect through the charitable deduction for donations. The former effect depends on whether volunteering is simply a competing use of time, such as leisure, work, and household production, or whether it is a form of investment in human capital. The latter depends on whether gifts of money and gifts of time are complements or substitutes. The evidence on these questions is both limited and mixed. An analysis of volunteering by women suggests that contributions and volunteering are complements, implying that the charitable deduction encourages volunteering as well as donations. Also, volunteering tends to be crowded out by market work. To the extent that work and volunteering are rival uses of time, tax policies that encourage labor force participation among women tend to reduce their volunteering.

There is a much larger econometric literature on the effect of taxes on corporate giving. The new evidence presented in this study is broadly consistent with earlier findings and suggests that the corporation tax has both a price and a net income effect on corporate giving. Such behavior by firms would be consistent with a number of models other than pure profit maximization. The estimates of the income elasticity, using the cash flow measure of income, are close to one, suggesting that contributions are proportional to aftertax income. An important question remains, however, regarding the proper specification of this income measure. Qualitatively similar results are obtained using aftertax net income. The estimated price elasticities appear to be smaller than those estimated for individual contributions, but the estimates presented here leave some doubt because of the difference in results using marginal and average tax rates, respectively. Taken together, these results suggest that the price elasticity is less than one in absolute value. Finally, there is evidence that corporations time their gifts in order to take more deductions during years in which tax rates are higher.

Tax effects are also apparent in bequest giving and foundation activity. The econometric evidence of bequest giving presented in this study, like previous work, produces estimates subject to substantial variation. Nevertheless, these estimates imply that the deduction in the estate tax by and large has quite a strong effect. Most estimates of the price elasticity are greater than one in absolute value. Bequests also rise with estate

size, but the elasticity of estate size is substantially smaller than one. On estimates obtained for the very important group of the wealthiest decedents, those with net estates over $1 million, the estimated price elasticity is greater than two in absolute value, and the income elasticity exceeds one. In any assessment of the aggregate effect of estate tax changes on charitable bequests, the largest estates are of paramount importance because they account for most bequest giving. No comparable econometric evidence on foundation activity has as yet been produced. The limited information that is available suggests, though, that the provisions in the Tax Reform Act of 1969 relative to private foundations had the effect of raising payout rates without threatening the existence of foundations.

The major conclusion arising from this empirical work is that federal taxes, especially tax provisions affecting charitable giving, have important effects on the size and distribution of giving. The deductions in the individual, corporate, and estate taxes are of course most important, in the sense that no other tax changes with comparable revenue effects would influence charitable giving as much as the elimination of these deductions. But other, more general tax provisions and changes also have profound effects on giving. Probably the most important of these effects arises from the combination of the standard deduction, nominal tax schedules, and inflation. The effect of inflation has been to erode the value of the standard deduction, causing an increase in the proportion of taxpayers who itemize their deductions. This in turn affects the price of giving. Another important set of tax changes not directly related to charitable giving have been revisions in the rate schedule itself. In particular, the decline in top marginal tax rates from 91 to 50 percent over the last three decades has had a sizable effect on the prices faced by taxpayers in the highest income classes. Tax reforms such as the 1981 tax act combine several changes that are likely to affect charitable giving. Simulations based on estimated models of individual giving suggest that the combined effect will be a slight increase in the rate of giving, resulting from a large increase in giving by nonitemizers caused by the "above-the-line" deduction and a slight decline in giving among upper-income taxpayers resulting from the drop in tax rates.

Similarly, the econometric evidence implies that federal taxes will affect other forms of giving as well. Policies that encourage labor force participation of women —for example, the deduction for secondary earners— may tend to discourage volunteering. The extension of the charitable deduction to nonitemizers, on the other hand, may encourage volunteering if gifts of time and money are complementary. The recent changes in the corporate tax resulting in an increase in the number of firms with no tax liability will tend to discourage corporate giving by raising its average net price. The implications of the empirical analysis of bequests are similar to those applying to individual contributions. The 1981 tax act, which reduces the number of taxable estates and lowers the marginal tax rate for many estates, is likely to discourage bequest giving by raising the net price of charitable bequests.

Simulations of individual giving show that one of the most important implications of existing empirical work is that tax policy can affect the distribution as well as the level of contributions. Since donors at various income levels differ markedly in their propensities to make gifts to various kinds of charitable organizations, tax changes that affect the distribution of giving among income classes will tend to affect the distribution of support to various parts of the philanthropic sector. For example, the 1981 tax act had the effect of significantly reducing marginal tax rates for taxpayers in the top brackets in both the income and estate taxes. If the effect of such price changes outweighs the influence of changes in net income or net estate, which they in fact appear to do, these tax changes are likely to cut the relative share of giving undertaken by the wealthy. This would imply a decline in support for institutions such as colleges, universities, cultural institutions, and private foundations and toward religious organizations and certain health and welfare groups. It is important to emphasize, however, that implications such as these are based on price and income effects and do not account for any changes in behavior by donors or charitable organizations caused by other factors.

The econometric estimates also have implications for proposed or hypothetical tax provisions. Simulations in the text examine several proposals that involve changes in the charitable deduction or general tax rate revision. Probably the largest effect would be observed if the charitable deduction were eliminated altogether, perhaps as part of some comprehensive income tax. Such a change would have important effects on the distribution as well as the level of contributions, with gifts by wealthy taxpayers falling the most. Substituting a tax credit for the present deduction, depending on the rate used, primarily would have the effect of redistributing the pattern of gifts between low- and high-income groups. Smaller changes would come about as a result of less sweeping revisions, such as the constructive realization of appreciated assets given as gifts or the expansion of the deduction at low- and middle-income levels. Each of the proposals noted here would affect overall tax revenues, and it is important in simulating their effects to adjust for this. Similar effects could be calculated for bequest giving, with the elimination of the deduction in the estate tax having much the same kind of effect.

Tax Policy and Foreign Investment

David G. Hartman

Perhaps the most striking development on the economic scene in recent years has been the dramatic change in the structure of production and competition that is a result of growing internationalization. Not surprisingly, those in government who form economic policy, from individuals involved with antitrust regulation to those concerned with the monetary policy system, have been struggling to adapt to the obviously changed environment of funds, goods, and services flowing with relative freedom across national boundaries.

The growth of U.S.-based multinational firms provided one of the first signals of the challenges in store for domestic policymakers, as it strained a tax system that had been designed for a closed economy. A number of important policy issues have arisen in connection with the new "openness" of the U.S. economy, but I will limit my attention here to the corporate income tax and its application to multinational firms.[1]

It is important to place these issues of openness in the historical context of a tax system designed for a closed economy. That system now applies to firms that have a great deal of flexibility, both in transferring funds between countries, and in the pricing of their international, within-firm transactions. That history explains why policy debates have concentrated so heavily on protecting the tax base against manipulation rather than on the more subtle issues of the incentives created by a tax system not constructed with multinational firms in mind.

There are many examples of such manipulation: for foreign sales, firms set up "dummy" subsidiaries that have little economic function except to collect profits outside the reach of the American taxing authorities. These cases are interesting and instructive in highlighting the difficulties of designing a national tax system that will apply to entities that have a greater than national presence. However, the focus of my work has been on the effects of the U.S. tax structure on investment incentives and the way our system interacts with tax systems abroad.

To be certain, policy debates have at times concerned investment incentives, so my research is of more than academic interest. For example, the U.S. system—which allows a credit (complete offset) against the U.S. tax liability for taxes paid to foreign governments, and does not impose the U.S. tax on income earned abroad until it is repatriated—has been criticized on the grounds that it is "too encouraging" to U.S. investment abroad. Hence, it is argued, jobs are transferred abroad for tax reasons, rather than for reasons of efficiency.

Similarly, "host" countries that are interested in encouraging foreign firms to increase local investment question the effectiveness of providing tax incentives, since capital-exporting nations with a foreign tax credit will simply collect any revenue forgone by the host country when earnings are repatriated. This argument has particular importance for developing countries that typically have corporate income tax rates well below the rates prevailing in capital-exporting countries. It is crucial in the context of *U.S.* foreign direct investment, since the United States has refused to allow "tax sparing"—the crediting of a tax that is forgiven by a developing country's incentive scheme—partly on the grounds that equal treatment of capital employed in different nations is necessary for the efficient worldwide allocation of investment.

Similarly, recent debates over the so-called unitary method of taxing multinational firms have advanced beyond the original concern over firms manipulating reported profits to avoid state taxes.[2] Now that behavioral responses of firms and threats of such action are gaining attention, states are reviewing their use of the method.

In a series of papers, I have reassessed the marginal investment incentives produced by the basic U.S. system.[3] I began with a review of the previous literature that revealed two directly conflicting arguments: (1) that a rise in the U.S. tax rate on foreign-source income would cause foreign investment to become less attractive and, hence, *reduce* its level; and (2) that a rise in the U.S. tax rate would cause repatriation of earnings to become less attractive (since the tax is deferred until profits are received) and, therefore, *increase* the level of foreign investment.

It is important to recognize that for a firm to transfer funds to its foreign affiliate to finance new investment while receiving dividends from the affiliate, the firm would be required to pay a U.S. income tax, even though its financial or real investment position did not change. One would therefore not expect to see firms engaging in both transactions. Thus, the marginal investment

[1] *This research summary ignores taxes on income from portfolio investments abroad, one aspect of which is considered in D. G. Hartman, "Taxation and the Effects of Inflation on the Real Capital Stock in an Open Economy,"* International Economic Review *20, 2, June 1979, pp. 417-425, as well as the implications of international capital flows (which I examine in D. G. Hartman, "The International Financial Market and U.S. Interest Rates,"* Journal of International Money and Finance *3, 1, April 1984, pp. 91-103) for the ability of tax policy to influence domestic savings and investment.*

[2] *See, for example, the summary of C. E. McLure, Jr.'s work on "Defining a Unitary Business: An Economist's View," in* NBER Digest, *October 1983.*

[3] *D. G. Hartman, "Tax Policy and Foreign Direct Investment,"* Journal of Public Economics, *forthcoming, and NBER Working Paper No. 689, June 1981; "Domestic Tax Policy and Foreign Investment: Some Evidence," NBER Working Paper No. 784, October 1981; and "Tax Policy and Foreign Direct Investment in the United States,"* National Tax Journal, *forthcoming, and NBER Working Paper No. 967, August 1982.*

incentives facing an unconstrained firm may be analyzed by distinguishing between those firms who finance their marginal foreign investments out of earnings that their affiliates retain abroad ("mature" firms), and those firms whose foreign operations are growing too rapidly relative to foreign earnings ("immature" firms) and who must therefore rely on transfers of funds from the United States to finance marginal investments. The rather crude evidence that is available suggests that U.S. firms can be classified as either mature or immature, but that the overwhelming majority of U.S. investment abroad is accounted for by the mature firms.[4]

Consequently, the issue of major practical importance is: What incentives face mature firms and what implications do changes in the tax law have for their behavior?[5] For the mature firm, the U.S. corporate income tax is literally a tax on dividend payments from a foreign subsidiary to the U.S. parent. An analogous economic question is: What are the incentive effects of a tax on corporate distributions to shareholders? A tax on dividends paid by a domestic firm to its shareholders has been analyzed in prior Bureau work, such as that by Alan Auerbach and David Bradford.[6] As they have indicated, a dividend tax is unavoidable in the sense that distributions to shareholders, whether made now or in the future, face the same tax in terms of present value. In the context of my work, an increase in the rate of tax on foreign-source income provides neither a disincentive to foreign investment, as most have assumed, nor an incentive to foreign investment, as some have argued. The logic behind this conclusion is that the "disincentive to invest abroad" and the "incentive to reinvest abroad," described earlier, balance exactly. The irrelevance of the tax *rate* to the reinvestment decision extends to other policy measures as well.

For instance, a corollary argument implies that the elimination of the foreign tax credit would also be neutral with respect to investment by mature firms. Such a policy change would result in a nearly confiscatory total tax burden on foreign-source income. While it would apparently make foreign investment highly unattractive, repatriation of earnings from prior foreign investments would be identically disadvantaged.

Some of my papers, cited earlier, go on to describe what happens to incentives if firms: (1) are somehow able to avoid the U.S. tax; (2) believe that the tax system will change in certain ways in the future; or (3) are immature. But believing such circumstances to be of limited relevance, I expect to observe reinvestment abroad as long as the return, net of the host country tax, exceeds the aftertax return available in the United States.

There are other important implications of the surprising neutrality of the U.S. tax on foreign-source income. One is that a tax change that is *apparently* neutral, such as a tax rate cut applied to both domestic- and foreign-source income, can have very asymmetrical effects, strongly favoring domestic investment while not directly influencing the effective net rate of return available abroad. Such a tax cut could result in investment being reallocated toward the United States, a point I will return to later. It is also important to note that host country tax incentive measures will tend to produce the full incentive effects that would be realized if there were no home country tax and credit mechanism.

Having reviewed these arguments, I will now turn to the significance of taxes. Looking at aggregate data has convinced many researchers that tax rates among countries differ so little from the U.S. rate as to render taxes a very minor consideration in firms' investment decisions. This conclusion would have been particularly appropriate had our theory not rejected the notion that the U.S. foreign tax credit further reduces the "effective differential" between taxes. However, similar overall average tax rates can mask wide divergences in the tax treatment relevant to a particular investment by a given firm or industry.

To explore this possibility, Daniel Frisch and I undertook the measurement of effective tax rates across 15 industries and 16 countries, using Treasury Department data from "information returns" for 1968 and 1972.[7] Since we could measure only the taxes and incomes of firms, the data are far from ideal. The measured effective tax rates reflect factors (such as the pattern of prior investments as it influences current depreciation allowances) which are not relevant to current investment decisions. However, we can verify that a surprisingly large fraction of the variation across countries in measured effective tax rates can be accounted for by differences in statutory rates, giving more credence to our figures as being representative.

We find that the "national" effective tax rates do indeed cluster near the U.S. rate, with an average of 39.5 percent for 1968 and an average deviation of only 4.8

[4] *D. G. Hartman, "Tax Policy and Foreign Direct Investment."*

[5] *To focus on how the distinction between mature and immature firms affects the analysis, I will not review the more general questions I have also explored, including: the responsiveness of foreign governments to changes in U.S. policy (D. G. Hartman and M. Feldstein, "The Optimal Taxation of Foreign Source Investment Income,"* Quarterly Journal of Economics *XCIII, 4, November 1979, pp. 613-629, and D. G. Hartman, "Deferral of Taxes on Foreign Source Income,"* National Tax Journal, *December 1977); the ability of foreign affiliates to finance their risky investments through local borrowing (D. G. Hartman, "Foreign Investment and Finance Risk,"* Quarterly Journal of Economics *XCIII, 2, May 1979, pp. 213-232); and the full range of general equilibrium effects when multinational firms produce internationally traded goods (D. G. Hartman, "Investment Income,"* Journal of Public Economics *13, 2, April 1980, pp. 213-230).*

[6] *A. J. Auerbach, "Share Valuation and Corporate Equity Policy,"* Journal of Public Economics *11(3), June 1979, pp. 291-305; and D. F. Bradford, "The Incidence and Allocation Effects of a Tax on Corporate Distributions," NBER Reprint No. 162, May 1981.*

[7] *D. G. Hartman and D. J. Frisch, "Taxation and the Location of U.S. Investment Abroad," NBER Working Paper No. 1241, November 1983.*

percentage points. Nevertheless, when the entire industry-country matrix of tax rates is examined, striking differences in rates are observed. In a number of countries, for example, one finds differentials of 50 percentage points between the effective tax rates facing the least- and most-favored industries. Even larger variations are seen in the treatment of the same industry across countries. For example, if we examine the consistency of treatment of industries by the developing countries on which we have data (Mexico, Argentina, Venezuela, and Brazil), we find that among the six correlations between the sets of tax rates, only three are positive and the largest is only 0.17.

Very large divergences in the tax treatment of particular industries are, of course, consistent with the evidence on the tax systems of the United States, the United Kingdom, Sweden, and Germany, produced by a recent NBER project directed by Mervyn King and Don Fullerton.[8] Their study, by focusing on the more straightforward issue of the tax treatment of domestic firms in countries where a great deal of information was readily available, was able to go far beyond the simple effective tax rate calculations Frisch and I have made. Their result, that tax rates differ enormously by type of investment, makes our findings on variations across industry for a wider variety of countries at least seem plausible.

However, both Fullerton and Auerbach have emphasized in other Bureau work the degree to which average effective tax rates can be misleading indicators of marginal incentives. Nevertheless, there is little alternative to our use of firm data, given the available information. Getting detailed information on how tax codes in many countries deal with the foreign investor may itself be a nearly hopeless task. Further, much of the actual practice is a product of treaties negotiated with individual source countries. Even more discouraging, the tax treatment of foreign investment is often governed by negotiations with individual firms, with outcomes not necessarily publicly disclosed. So, despite the limitations of using data on actual tax payments, they are the only available source of information on disaggregated tax rates facing U.S. firms.

Frisch and I also use these figures to analyze the responsiveness of investment decisions to tax rates, providing a useful complement to the evidence on aggregate foreign investment through time, to which I will return later. Simple cross-section models, in which foreign direct investment is determined by the net rate of return available to an industry in a country (or by the gross rate of return and a tax parameter, separately), produce highly significant results. Specifically, foreign investment during 1968–72 is significantly influenced (negatively) by the 1968 foreign corporate tax rate and (positively) by the 1968 gross rate of return. We undertook a variety of experiments, including the use of industry and country dummy variables, to rule out, as much as possible, the chances that the results are caused by some other relationship in the data that we might have inadvertently captured in our simple test. The results turn out to be quite robust: that is, insensitive to any of the changes we try. Perhaps surprising in light of my discussion of the difficulty of measuring tax rates, the tax parameter has both a larger and a more significant estimated effect than the rate of return.

Consistent with the theory described previously and the observation that most investment is *re*investment, the "deferrable taxes" facing firms upon repatriation of profits play no statistically significant role in the investment decision. Thus, the results support a conclusion that changes in the U.S. tax treatment of foreign-source income are likely to be neutral in the short run. Even more strongly, the results suggest that foreign tax incentives can influence investment patterns importantly, despite the U.S. foreign tax credit.

As I have already noted, this analysis of investment across industries and countries should be viewed as complementary to other evidence on the manner in which aggregate foreign investment responds to changes in the U.S. corporate income tax. Appealing to the theoretical discussion above, we would expect not only to observe foreign investment responding to changes in the net-of-foreign-tax rate of return abroad and being fairly unresponsive to changes in the U.S. tax treatment of foreign-source income, but also to detect highly asymmetric effects of domestic and foreign investment caused by "apparently neutral" U.S. tax changes. Thus, for example, a general reduction in the U.S. corporate tax rate would have no direct incentive effect on reinvestment abroad, while favoring domestic investment. Consequently, a firm's choice between home and foreign investment would tend to be shifted in favor of the latter.

The evidence I have gathered is strong in its support of this proposition.[9] Describing the foreign investment decision as dependent on the rates of return available at home and abroad successfully explains annual fluctuations in reinvestment abroad and verifies the importance of both rates of return in those decisions. Further, when the U.S. net rate of return is divided into a gross rate of return and a tax factor, both are highly significant and virtually identical in the magnitude of their impact on foreign investment. That is, a cut in the U.S. tax on corporate income produces almost exactly the same effect on foreign investment as does an equivalent increase in the domestic gross capital return. So, once again we conclude that any direct effect on foreign investment caused by changes in U.S. tax policy is "small" compared to the effects produced by the policy's impact on the relative attractiveness of domestic investment. An important implication of this result is that a change in the U.S. tax rate designed to foster investment would, according to Feldstein's estimate of

[8] *M. A. King and D. Fullerton, eds.,* The Taxation of Income from Capital, *Chicago: University of Chicago Press, 1984.*

[9] *D. G. Hartman, "Domestic Tax Policy and Foreign Investment: Some Evidence."*

the domestic effect[10] and my estimate of the influence on investment abroad, reduce foreign investment by U.S. firms by at least twenty cents for every dollar that domestic investment increases.

Whether this trade-off would be disturbing to an advocate of lower taxes on corporate capital income depends on the motives for cutting taxes. If the productivity of the U.S. economy is at issue, the considerations I have raised might be deemed of little importance. On the other hand, if the primary emphasis is on expanding savings to provide for future income, the significant "leakage" in incentive effects in the open economy might be of considerable concern. Finally, to the extent that promoting international competitiveness is one's goal, it could be argued that investment abroad encourages U.S. exports; discouraging such investment would be an important drawback to any policy.

The reverse side of this issue is investment by foreign firms in the United States, a factor that in some recent years has become even more significant than U.S. investment abroad. The incentive effects of host country tax policy are clear from the discussion above: U.S. tax policy can have important effects on the incentive for foreigners to invest here, regardless of the availability of a tax credit in their home country. The empirical support I have found for these incentives is surprisingly strong, given the data problems inherent in describing the choices facing foreign firms.[11] Particularly important is a term measuring the tax rate on a U.S. investment facing a foreign investor relative to that faced by a U.S. investor. My results imply that a policy to encourage domestic holding of corporate capital, by raising its valuation, tends to discourage foreigners' investments in U.S. capital.

I view the research described here as merely a beginning of the investigation into tax effects on foreign direct investment, but it is a beginning that highlights the importance of the issues. Further work is needed to draw the full implications from even the simple theory of foreign investment outlined here. One issue that I am currently investigating is that of "transfer pricing." In particular, the incentives for mature firms to price transactions across national borders but within the firm in such a way as to minimize tax and/or tariff liabilities are not nearly so clear as they appear.[12] It will also obviously be important to obtain more reliable data in order to sharpen our understanding of the whole range of behavioral responses that I have described.

[10] *M. Feldstein, "Inflation, Tax Rules, and Investment: Some Econometric Evidence," NBER Reprint No. 300, August 1982.*

[11] *D. G. Hartman, "Tax Policy and Foreign Direct Investment in the United States," National Tax Journal, forthcoming, and NBER Working Paper No. 967, August 1982.*

[12] *D. G. Hartman and J. Dutton, "Taxation and Transfer Pricing by Multinational Firms," forthcoming as an NBER Working Paper.*

Economic Outlook Survey

Second Quarter 1984

Victor Zarnowitz

According to the May survey taken by NBER and the American Statistical Association, 35 professional forecasters predict that the economy will continue to grow this year and the next, although at less than half the high speed it attained last winter. A recession is viewed as relatively unlikely, at least before mid-1985. The unemployment rate will continue to drift down but slowly. There will be significant but gradual and moderate increases in the measures of inflation. The big rise in interest rates in 1984:2 will be followed by much smaller upward movements that may tend to taper off late this year and in the first half of 1985.

Lower Growth Expected in the Year Ahead

As reported by the 35 survey respondents, the mean probabilities attached to the alternative outcomes for year-to-year changes in real GNP have the following percentage distributions (figures add up to 100 except for rounding).

Percentage of Change in Real GNP	*Percentage of Responses*	
	1983-84	*1984-85*
6 and higher	30	6
4-5.9	55	24
2-3.9	11	40
Less than 2	4	29

According to the medians of the forecasts, real GNP will rise 5.9 percent in 1983-84 and 3.0 percent in 1984-85. This represents more of a slowdown than was predicted in the previous (February) survey, when the corresponding figures were 5.2 percent and 3.2 percent. Growth in 1983-84 may turn out to be higher still as the forecasts were made before the latest upward revisions of the data.

In the year ahead (1984:2-1985:2), real growth is expected to average 3.4 percent. Six percent of the individual responses fall in the 4.5-6.4 percent range; more than 42 and 39 percent in the ranges of 3.5-4.4 percent and 2.5-3.4 percent, respectively; and 12 percent are less than 2.5 percent.

Thus most forecasters anticipate a sharp slowdown in the growth of the economy's output after the steep recovery of 1983-84. (The last four quarterly increases at annual rates averaged 7.8 percent.) A comparison of annual forecasts for 1985:1 and 1985:2 suggests that many expect the expansion to flatten in the second half of next year.

Projections of GNP and Other Economic Indicators, 1984–85

	Annual				
				Percent Change	
	1983 Actual	1984 Forecast	1985 Forecast	1983 to 1984	1984 to 1985
1. Gross National Product ($ billions)	3310.5	3650.0	3969.5	10.3	8.8
2. GNP Implicit Price Deflator (1972 = 100)	215.6	224.7	236.8	4.2	5.4
3. GNP in Constant Dollars (billions of 1972 dollars)	1535.3	1626.0	1674.0	5.9	3.0
4. Unemployment Rate (percent)	9.6	7.6	7.1	-2.0[1]	-0.5[1]
5. Corporate Profits After Taxes ($ billions)	130.6	155.0	168.2	18.7	8.5
6. Nonresidential Fixed Investment (billions of 1972 dollars)	168.4	192.0	203.6	14.0	6.1
7. New Private Housing Units Started (annual rate, millions)	1.7	1.8	1.6	5.9	-9.4
8. Change in Business Inventories (billions of 1972 dollars)	-2.1	19.6	15.0	21.7[2]	-4.6[2]
9. Treasury Bill Rate (3-month, percent)	8.6	9.8	10.4	1.1[1]	0.6[1]
10. Consumer Price Index (annual rate)	3.2	4.6	5.4	1.4[1]	0.8[1]

	Quarterly							
		1984			1985		Percent Change	
	1984 Q1 Actual	Q2	Q3	Q4	Q1	Q2	Q1 84 to Q1 85	Q2 84 to Q2 85
		Forecast						
1. Gross National Product ($ billions)	3541.2	3609.5	3688.5	3771.0	3849.5	3927.0	8.7	8.8
2. GNP Implicit Price Deflator (1972 = 100)	220.7	223.0	226.0	228.8	231.8	235.0	5.0	5.4
3. GNP in Constant Dollars (billions of 1972 dollars)	1604.3	1619.0	1632.5	1646.0	1661.0	1674.0	3.5	3.4
4. Unemployment Rate (percent)	7.9	7.7	7.5	7.4	7.3	7.2	-0.6[1]	-0.4[1]
5. Corporate Profits After Taxes ($ billions)	148.5	151.5	157.0	161.0	164.0	166.8	10.4	10.1
6. Nonresidential Fixed Investment (billions of 1972 dollars)	185.9	190.0	193.7	197.0	199.0	202.0	7.0	6.3
7. New Private Housing Units Started (annual rate, millions)	1.9	1.8	1.8	1.7	1.7	1.6	-13.6	-9.3
8. Change in Business Inventories (billions of 1972 dollars)	26.6	17.6	17.0	16.0	16.0	15.0	10.6[2]	-2.6[2]
9. Treasury Bill Rate (3-month, percent)	9.1	9.8	9.9	10.2	10.1	10.3	1.0[1]	0.5[1]
10. Consumer Price Index (annual rate)	4.4	4.3	5.0	5.2	5.3	5.6	0.9[1]	1.3[1]

SOURCE: National Bureau of Economic Research and American Statistical Association, Business Outlook Survey, June 1984. The figures on each line are medians of thirty-five individual forecasts.

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

A Slower but Continuing Decline in Unemployment

The unemployment rate will decline from 7.7 to 7.2 percent of the civilian labor force between 1984:2 and 1985:2, according to the median forecasts from the survey. Some individual predictions are lower; a few fall below 7 percent early next year. The recently announced decline to 7.5 percent in May seems to have taken many forecasters by surprise. The average level of joblessness in 1983 was 9.6 percent; for 1984, it is predicted to be 7.6 percent; for 1985, 7.1 percent. The survey responses generally agree that unemployment will move downward next year but at a much reduced pace.

How Likely Is a Recession in the Near Future?

Although the mainstream view is that business activity at large will decelerate, a downturn is not considered imminent. The probabilities of a decline in real GNP, as assessed by the respondents, average 11, 16, 22, and 30 percent in the four successive quarters 1984:3–1985:2. While rising, they are still relatively low. However, each of the recessions since 1968 has been preceded by a runup in these probabilities, which tend to rise in the 30–45 percent interval before the event (and climb much higher, of course, after the downturn has occurred and gradually is being recognized). So, if these assessments were to be raised in the forthcoming surveys to average levels of more than 30 and 40

percent, this would amount to an early warning signal worth watching.

Forecasts of a Moderate Rise in Inflation

The median predictions of the consumer price index (CPI) show the annual rates of inflation increasing gradually from 4.3 percent in 1984:2 to 5.6 percent in 1985:2. For 1984 as a whole, the average is 4.6 percent (up from 3.2 percent in 1983); for 1985 it is 5.4 percent (which implies a steady inflation in the second half of next year).

The forecasts of the GNP implicit price deflator (IPD) are similar: a rise of 4.2 percent in 1983–84, 5.4 percent both in 1984–85 and between 1984:2 and 1985:2. The percentage distributions in the means of the reported probabilities for changes in IPD show a clear shift to higher inflation intervals:

Percentage of Change in IPD	*Percentage of Responses*	
	1983–84	*1984–85*
8 and higher	2	5
6–7.9	17	32
4–5.9	64	50
Less than 4	17	13

The distribution of individual forecasts of inflation is skewed toward above-average rates (as in the previous survey, only more so). This is illustrated by the following tabulation for the rates of change in IPD, 1984:2–1985:2.

Percentage of Rates of Change in IPD 1984:2–1985:2	*Percentage of Responses*
6.5 and higher	5.7
5.5–6.4	31.4
4.5–5.4	51.4
3.5–4.4	8.6
Less than 3.5	2.9

Interest Rate Predictions: Mixed but Mostly Rising

The three-month Treasury bill rate, having jumped from 9.1 percent in 1984:1 to 9.8 percent in 1984:2, is expected to creep up irregularly to 9.9 percent, 10.2 percent, 10.1 percent, and 10.3 percent in the following four quarters (through 1985:2). However, these median forecasts conceal much dispersion among the individuals. For example, the reported predictions for 1984:4 range from 8.4 percent to 11 percent; those for 1985:2 range from 9 percent to 13 percent. About two-thirds of the respondents expect the rates to rise, one-quarter to fall, and a few foresee no significant changes.

The responses concerning new high-grade corporate bond yields show relatively less variation over time and across individuals. The means and standard deviations (in parentheses) are, in percentages, 13.5 (0.5) for 1984:2 and 13.8 (0.9) for 1985:2. Forecasts of mild rises prevail through mid-1985 but later some declines may occur, as suggested by the average predictions for 1985 as a whole—13.6 (0.9).

A Slowing Expansion of Profits, Industrial Production, and Investments

Aftertax corporate profits will gain nearly 19 percent in 1983–84, about 10 percent between 1984:2 and 1985:2, and 8.5 percent in 1984–85, according to survey averages. Forecasters see profits as expanding much faster than the values of total output or sales in 1984, somewhat more slowly than these values in 1985. (GNP in current dollars is expected to gain 10.3 percent this year, 8.8 percent next year.) The variance of the individual profit forecasts is high, but only a few respondents anticipate a peak in profits before mid-1985.

The output of manufacturing, mining, and utilities on average is expected to increase 11 percent in 1984, but only 3.7 percent between 1984:2 and 1985:2, and also 3.7 percent in 1985 compared with 1984. Most forecasts suggest a further slowdown during 1985, to annual rates of growth of 2.4 percent and less.

Inventory investment forecasts for 1984 have undergone strong upward revisions in the light of new data. In billions of 1972 dollars, the change in business inventories is expected to average nearly 20 in 1984, 15 in 1985.

Business Investment Very Strong in the Near Term

Nonresidential fixed investment in 1972 dollars will register large gains of 7–9 percent annual rate in the spring, summer, and winter quarters of 1984, according to the averages from the new survey. It should rise 14 percent in 1983–84. In 1985, however, the expansion in business investment is expected to slow down substantially. The median forecast is for an increase of 6 percent in 1984–85; the expected gains in 1984:1 and 1984:2 are 4 percent and 6 percent.

A Mild Downturn to Occur in Residential Construction

Housing starts, in million units at annual rate, will decline from 1.95 in 1984:1 to 1.65 in 1985:2. The group average forecasts for 1984 and 1985 are 1.80 (up 6 percent from 1983) and 1.63 (down 9 percent from 1984), respectively. Residential fixed investment in 1972 dollars will rise 14 percent in 1983–84 and will decline 3 percent in 1984–85, peaking at $61 billion, annual rate, in 1984:3.

Reduced Gains in Consumption

Total consumption expenditures in 1972 dollars are projected to increase about 5 percent in 1983–84, but only 3.2 percent in 1984:2–1985:2, and 3 percent in 1984–85. These group average forecasts are consistent with recent indications of greater caution on the part of the consumer and increased propensity to save. Lower consumer confidence may be related to expectations of higher interest rates and additional taxes in

1985. (About half of the forecasters assume a higher tax rate will be enacted.) Other possible depressants are the worries about renewed inflation and a financial crisis.

Divergent Trends in Government Spending

Federal government purchases of goods and services in 1972 dollars are expected to increase 3.6 percent in 1983–84, 7 percent in 1984:2–1985:2, and 6.6 percent in 1984–85. This sector, then, will be a source of strength. Most forecasters assume a buildup of more than 6 percent in defense outlays, although a sizable minority report working with lower figures.

State and local government figures are generally viewed as weak after allowing for price rises. They will increase 2.1 percent in 1983–84, 2.4 percent in 1984:2–1985:2, and 2.2 percent in 1984–85.

A Continuing Decline in Real Net Exports

The year-old rapid expansion of U.S. imports of foreign goods and services will continue and now will raise them above the stagnant exports of U.S. goods and services, so that net exports will be negative (all series being measured in real terms). According to the median forecasts, net exports in billions of 1972 dollars at annual rates will move up a little, from -8 in 1984:2 to -5 in 1985:2. Low exports, then, have become an even greater source of weakness than anticipated, but hope persists that the worst may be over. As many as 23 respondents express the assumption that the dollar will decline, only 6 that it will remain strong or stable. A comparison with previous surveys indicates that the former view is gaining.

Policy Assumptions

Forecasters are divided on whether additional taxes will soon be enacted and on the size of the buildup of defense outlays, as already noted. Twelve state that the growth of M1 will exceed 7 percent, eleven that it will be lower. M2 is seen by many as growing in the 7–11 percent range. The prevailing view on energy demand and prices continues: most forecasters anticipate that they will be stable or lower (nine survey members assume that prices will increase).

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

NBER Profiles

Charles T. Clotfelter

Charles T. Clotfelter, who is both associate professor of public policy studies and economics and vice provost for academic policy and planning at Duke University, has been a research associate in NBER's Program in Taxation since 1982. Clotfelter received his B.A. in history from Duke University and his Ph.D. in economics from Harvard University. He began his teaching career at the University of Maryland, where he was an assistant professor from 1974–79. In 1978–79, he was financial economist in the U.S. Treasury's Office of Tax Analysis; in 1979 he joined the Duke University faculty. Clotfelter was also a visiting scholar at the Institute for Research in Social Science at the University of North Carolina in 1982.

Clotfelter's areas of interest include urban economics and public finance. His work on these and other subjects have been published in many journals and books; most recently he has written *Federal Tax Policy and Charitable Giving* for NBER, to be published by the University of Chicago Press.

Clotfelter has served as a consultant to the U.S. Treasury's Office of Tax Analysis from 1979 to 1984. He also serves as vice president of the Southern Economic Association for the 1983–84 academic year.

Clotfelter and his wife Lucile, a medical student at the University of North Carolina, have two sons. While Lucile is on clinical rotation, the male Clotfelters keep busy with par-three golf, baseball games, and swimming near their home in Durham.

Ann F. Friedlaender

Ann Fetter Friedlaender, head of MIT's Economics Department, has served on NBER's Board of Directors since 1983. Friedlaender, who has taught at MIT since 1972, received her B.A. in economics from Radcliffe College and her Ph.D. in economics from MIT. From 1965 to 1974, prior to joining the MIT faculty, she taught in Boston College's economics department.

Friedlaender has served on the Executive Committee of the American Economic Association since 1982 and was chair of that group's Committee on the Status of Women in the Economics Profession from 1978–80. From 1974–78 she was a member of the Executive Committee of the National Research Council's Assembly of Behavioral and Social Sciences, and from 1974–76 she was on the examining committee of the Economics Graduate Record Examination. Friedlaender is currently on the Board of Editors of the *Public Finance Quarterly*, *Transportation Science*, and the *Logistics and Transportation Review*.

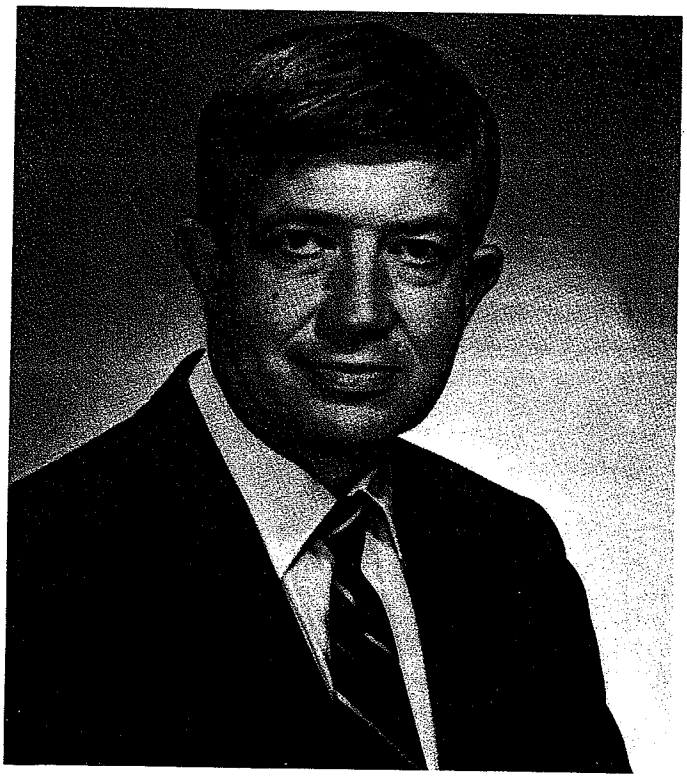
Having written extensively in the areas of public finance and transportation, Friedlaender's two most recent books were published in 1981: *Government Finance* (with John F. Due), and *Freight Transportation Regulation: Equity, Efficiency, and Competition* (with Richard H. Spady). She has also served as a consultant to a number of organizations including the Interstate Commerce Commission and the U.S. Department of Transportation.

A resident of Newton (MA), Friedlaender is married and has two children.

John M. Vernon

John M. Vernon, professor of economics at Duke University, was elected to NBER's Board of Directors in 1983. Vernon has been on the Duke faculty since 1966 and was a visiting fellow at Harvard University in 1969–70 and at the University of Bristol (England) in 1974–75.

Vernon, who holds a Ph.D. in economics from MIT, received his bachelor's degree in mechanical engineering from Georgia Tech and an M.B.A. from the University of Mississippi. His major research interests are industrial organization and public policy, economics of innovation, and applied microeconomics. His work in these areas, and in the field of regulation, has appeared in many journals and books; two recent (1983) books are *Managerial Economics: Corporate Economics and Strategy* (with T. Naylor and K. Wertz) and *The Regulation of Pharmaceuticals* (with H. Grabowski).



Vernon has been on the Board of Editors of *Managerial and Decision Economics* since 1979 and on the Research Advisory Committee to American Enterprise Institute's Center for the Study of Regulation since 1980. He has also served as a consultant to such organizations as the Federal Trade Commission, the National Academy of Sciences, the Tennessee Valley Authority, and the Electric Power Research Institute.

Vernon and his wife Jerry live in Durham (N.C.). They have four children.

Conferences

Business Cycles

A group of distinguished American macroeconomists met on March 23-25 for NBER's Conference on Business Cycles. The three-day program was:

SESSION ONE

Alan S. Blinder, NBER and Princeton University, and Douglas Holtz-Eakin, Princeton University, "Inventory Fluctuations in the United States since 1929"

Discussants: Moses Abramowitz, NBER and Stanford University, and Bennett T. McCallum, NBER and Carnegie-Mellon University

John B. Taylor, NBER and Princeton University, "Improvements in Macroeconomic Stability: The Role of Wages and Prices"

Discussants: Phillip Cagan, NBER and Columbia University, and Stephen R. King, Stanford University

Allen Sinai, Lehman Brothers Kuhn Loeb, and Otto Eckstein, DRI, "The Mechanism of the Business Cycle in the Postwar Era"

Discussants: Michael C. Lovell, Wesleyan University, and Kenneth Singleton, NBER and Carnegie-Mellon University

SESSION TWO

Ben S. Bernanke, NBER and Stanford University, and James L. Powell, "The Cyclical Behavior of Industrial Labor Markets: A Comparison of the Prewar and Postwar Eras"

Discussants: Martin N. Baily, NBER and Brookings Institution, and Edward P. Lazear, NBER and University of Chicago

Benjamin M. Friedman, NBER and Harvard University, "Money, Credit, and Interest Rates in the Business Cycle"

Discussants: Stephen M. Goldfeld, NBER and Princeton University, and Allan Meltzer, Carnegie-Mellon University

SESSION THREE

Robert J. Barro, NBER and University of Chicago, "The Behavior of U.S. Deficits" (NBER Working Paper No. 1309)

Discussants: John B. Shoven, NBER and Stanford University, and Martin J. Bailey, U.S. Department of State

Robert E. Hall, NBER and Stanford University, "The Role of Consumption in Economic Fluctuations"

Discussants: Angus Deaton, Princeton University, and Robert G. King, NBER and University of Rochester

Robert J. Gordon, NBER and Northwestern University, and John M. Veitch, Northwestern University, "Fixed Investment in the American Business Cycle, 1919-1983"

Discussants: Christopher A. Sims, NBER and University of Minnesota, and John Geweke, Duke University

SESSION FOUR

Rudiger Dornbusch and Stanley Fischer, NBER and MIT, "The Open Economy: Implications for Monetary and Fiscal Policy"

Discussants: Stanley W. Black, University of North Carolina, and Anna J. Schwartz, NBER

Geoffrey H. Moore, NBER and Columbia University, and Victor Zarnowitz, NBER and University of Chicago, "Historical Behavior of Cyclical Indicators"

Discussants: Alan J. Auerbach, NBER and University of Pennsylvania, and Solomon Fabricant, NBER

SESSION FIVE

Olivier J. Blanchard, NBER and MIT, and Mark Watson, Harvard University, "Are All Business Cycles Alike?"

Discussants: Robert J. Shiller, NBER and Yale University, and Peter Temin, NBER and MIT

Lawrence H. Summers, NBER and Harvard University, and J. Bradford DeLong, Harvard University, "What Really Caused the Change in Macro Behavior after World War II as Compared to before the War?"

Discussants: Herschel I. Grossman, NBER and Brown University, and Robert Eisner, Northwestern University

Geoffrey H. Moore and Victor Zarnowitz, "The Development and Role of the National Bureau's Business Cycle Chronologies"

Blinder and Holtz-Eakin's paper uses a newly constructed time series on inventory and shipments to show that there is little variation in the prewar and postwar behavior of inventories. However, they find that the variability of inventory fluctuations increased somewhat after World War II.

In his work, Taylor reveals that wages and prices have become more sticky over time. Moreover, policy has been less accommodative in the postwar period as a whole than in the thirty years preceding the war.

Sinai and Eckstein's work finds that the propagation (of business cycles) mechanism has not significantly changed in the postwar era. They attribute increased volatility (among economic variables) over time to the increased incidence of supply shocks later in the period.

In their study, Bernanke and Powell detect strong evidence of procyclical labor productivity, hours, and employment. They also find some cyclical sensitivity of the real wage; it was procyclical after the war and "half-out-of-phase" before.

Friedman demonstrates that the relationships usually taken to be central to monetary and financial aspects of business cycles have changed often and extensively in the last sixty years.

Barro's work shows stability in the process of generating deficits in the last sixty years. Even the deficit of the 1980s is broadly consistent with the estimated historical process, being less the result of a shift in fiscal policy than of the usual reaction to other influences.

Hall develops a framework in which movements along a consumption schedule and a shift in the schedule can be distinguished. He shows that shifts of the consumption schedule in the twentieth century have probably been an important but not dominant cause of fluctuations.

Gordon and Veitch create a new set of quarterly data extending back to 1919 on major expenditure components of GNP. Using it, they find significant effects, over and above simple accelerator effects, of financial variables on investment expenditures.

Dornbusch and Fischer document the increasing openness of the U.S. economy. They show, both theoretically and empirically, the importance of the exchange rate regime and of the policy responses of other countries.

The paper by Blanchard and Watson finds that the impulses that set off business fluctuations are small and emanate from various sources, not one predominant source. They also show that the pattern of business cycles varies considerably over time.

Summers and DeLong note that the prewar 1890–1929 (except World War I) period exhibited markedly more fluctuation of national product about its trend than did the 1949–82 period. A small portion of the reduction in variability can be attributed to the rising share of government expenditures in the economy. A significant share of the reduction is linked to reduced variability in the consumption of nondurable goods and services caused by expanding countercyclical programs for income transfer and consumer credit. The balance of the reduction in output fluctuations may be caused by increased wage and price *rigidity* possibly mitigating the depressing effect of deflation.

Moore and Zarnowitz, in "The Development and Role of the National Bureau's Business Cycle Chronologies," document cycles in the United States and six other countries. They find evidence that cycles are recurrent rather than discontinuous, being driven by their own dynamics rather than by external shocks.

In addition to the above-named authors and discussants, participants in the conference were: Lindley Clark, *Wall Street Journal*; Rosanne Cole, IBM Corporation; James W. Hanson, Exxon Corporation; Kenneth Militzer, AT&T; and David G. Hartman and Eli Shapiro, NBER. A conference volume that will include the papers and the discussions should be available sometime next year. Information about that volume will appear in a future issue of the *NBER Reporter*.

Pensions and Retirement in the United States

Members of NBER's project on pensions and distinguished guests met in San Diego on April 13 and 14 to discuss their work on various aspects of the U.S. retirement income system. The two-day agenda was:

Zvi Bodie, NBER and Boston University; Jay O. Light, Harvard Business School; Randall Mørck, Harvard University; and Robert A. Taggart, Jr., NBER and Harvard Business School, "Funding and Asset Allocation in Corporate Pension Plans: An Empirical Investigation" (NBER Working Paper No. 1315)
Discussant: André Perold, Harvard Business School

Alan J. Marcus, NBER and Boston University, "Corporate Pension Policy and the Value of PBGC Insurance" (NBER Working Paper No. 1217)
Discussant: William Sharpe, NBER and Stanford University

Robert C. Merton, NBER and MIT; Zvi Bodie; and Alan J. Marcus, "Pension Plan Integration as Insurance against Social Security Risk" (NBER Working Paper No. 1370)
Discussant: Jeremy I. Bulow, NBER and Stanford University

Jeremy I. Bulow; Randall Mørck; and Lawrence H. Summers, NBER and Harvard University, "Does the Market Value Pension Liabilities? An Efficient Markets Approach"
Discussant: Myron S. Scholes, NBER and Stanford University

Laurence J. Kotlikoff, NBER; and David A. Wise, NBER and Harvard University, "The Structure of Private Pension Plans and Labor Force Incentives"
Discussant: Thomas Gustafson, U.S. Department of Health and Human Services

Edward P. Lazear and Sherwin Rosen, NBER and University of Chicago, "Pension Formulas and Their Impacts on Various Demographic Groups"
Discussant: Sylvester Schieber, Wyatt Company

Herman B. Leonard, NBER and Harvard University, "Investing in the Defense Work Force: The Debt and Structure of Military Pensions"
Discussant: Laurence J. Kotlikoff

Michael J. Boskin and John B. Shoven, NBER and Stanford University, "Replacement Rates for the Elderly"
Discussant: Alan L. Gustman, NBER and Dartmouth College

B. Douglas Bernheim, NBER and Stanford University, "Dissaving during Retirement"
Discussant: Michael D. Hurd, NBER and State University of New York, Stony Brook

R. Glenn Hubbard, NBER and Northwestern University, "Uncertain Lifetimes, Pensions, and Individual Saving" (NBER Working Paper No. 1363)

Discussant: Olivia S. Mitchell, NBER and Cornell University

Laurence J. Kotlikoff; John B. Shoven; and Avia Spivak, Stanford University, "Annuity Markets, Savings, and the Capital Stock" (NBER Working Paper No. 1250)

Discussant: Michael Rothschild, NBER and University of California, San Diego

The paper by Bodie, Light, Mørck, and Taggart contrasts and empirically tests two different views of corporate pension policy: (1) the traditional view, that pension funds are managed without regard to either corporate financial policy or the interests of the corporation and its shareholders; and (2) the corporate financial perspective, represented by the recent theoretical work of several NBER associates, which stresses the potential effects of a firm's financial condition on its pension funding and asset allocation decisions. The corporate financial perspective predicts that profitable firms will tend to fund their pension plans more fully than less profitable firms and will tend to invest more heavily in bonds to maximize the tax advantage of having a pension plan. The authors find several pieces of evidence to support the corporate financial perspective. First, they find a significant inverse relationship between firms' profitability and the discount rates that they choose in reporting their pension liabilities. In view of this, the authors adjust all reported pension liabilities to a common discount rate assumption. They then observe a significant positive relationship between firm profitability and the degree of pension funding, as is consistent with the corporate financial perspective. There is also some evidence that firms facing higher risk and lower tax liabilities are less inclined to fund their pension plans fully. On the asset allocation question, the authors find that the distribution of plan assets invested in bonds is bimodal, but that it does not tend to cluster around extreme portfolio configurations to the extent predicted by the corporate financial perspective. Also, the percentage of assets invested in bonds is negatively related to both the total size of the plan and to the proportion of unfunded liabilities. The latter relationship shows up particularly among the riskiest firms and is consistent with the corporate financial perspective on pension decisions.

Marcus's paper deals with the issue of valuing the pension insurance provided by the Pension Benefit Guarantee Corporation (PBGC) to corporate defined-benefit plans. He derives the value of PBGC insurance under two scenarios. The first allows for voluntary termination of an underfunded plan, which appears to be legal under current statutes. In the second scenario, termination of an underfunded plan is prohibited unless the firm is bankrupt. Marcus examines optimal pension funding strategy under each scenario and presents empirical estimates of the PBGC's liability in each case. These show that a small number of funds account for a large fraction of total prospective PBGC liabilities, that those total liabilities greatly exceed current PBGC reserves for plan terminations, and that PBGC liabilities could be substantially reduced by the prohibition of voluntary termination.

In their paper, Merton, Bodie, and Marcus focus on a hitherto unexplored aspect of the integration of pension plans with Social Security. The manifest purposes of integrating with an employer-provided pension plan with Social Security are: (1) to insure adequate retirement income for all covered employees; and (2) to insure equity in retirement income defined as total replacement rates that are equal for all employees regardless of salary level. The focus of the authors' paper is on an equally important consequence of integration: the alteration of the risk-bearing relationships between employees, employers, and the government vis-à-vis Social Security benefits. The main alteration is that the employer, in effect, insures his covered employees against adverse changes in their Social Security (retirement) benefits. The authors analyze the effects of a switch from a nonintegrated to an equivalent-cost integrated plan when private benefits are fixed in nominal terms and when they are indexed. They also consider the effects of ad hoc post-retirement benefit increases and the incentive effects on worker mobility of the adoption of integrated plans.

The results reported in the paper by Bulow, Mørck, and Summers confirm earlier analyses by Feldstein and others suggesting that the stock market valuation of firms reasonably accurately reflects their pension funding status. Moreover, the authors demonstrate that this funding is not simply a consequence of "weak-firm" effects. Their results also suggest that the availability of the voluntary termination option influences the market valuation of pension liabilities. Finally, they provide some evidence for market valuations of firms reflecting implicit contractual liabilities to pay older workers amounts in excess of their marginal products. These contractual liabilities appear to be denominated in real rather than nominal terms.

In their paper, Kotlikoff and Wise find that there is a strikingly wide variation in the incentive effects of pension plans. Typical plan designs provide a strong incentive for retirement at the plan's normal retirement age, and several plan types provide a strong incentive to retire at the age of early retirement. For some employees, vesting could be a very important determinant of labor force participation. Given normal and early retirement ages, there is little difference in plan accrual profiles by industry or by occupation. Differences in pension benefits by industry depend more on the type of plan than on variations among plans with the same basic provisions. Because women typically live longer than men, accrued pension benefits at any age are higher for women than for men, about 13 percent on average at age 65, for example. The authors conclude that the rapid increase in pension plan coverage over the past two or three decades may well have contributed substantially to the reduction in labor force participation of older workers during this period. The plans may also have an important effect on labor mobility.

Lazear and Rosen focus on how the size of a pension tends to vary with the sex and race of the individual, conditional on the individual's having a pension. Using data from the May 1979 Current Population Survey, they first try to determine the average tenure, age, and salary of the typical retiree by sex and race. They then use the Bankers Trust *Corporate Pension Plan Study* (1980) to derive data on pension plan characteristics. Their computations suggest that pension plans may exacerbate black-white compensation inequality while reducing male-female compensation inequality. Even though females are less likely than males to work in jobs entitling them to pensions, females who are eligible for pensions do receive relatively generous ones. The average pension that the typical retiring female receives is well below that of the typical male retiree, but the difference is not as pronounced as male-female differences in salary.

Leonard provides a description and analysis of the U.S. military retirement system with respect to both the incentives it provides for retention and its current and accumulated costs. He also discusses and analyzes the proposals for reforming the system advanced by the Grace Commission. Leonard estimates that the unfunded liability of the military retirement system in the United States currently exceeds $500 billion and is therefore about 40 percent as large as the explicit national debt. The incremental obligation taken on each year has an equivalent current cost in excess of 40 percent of other military compensation, broadly defined, and in excess of 55 percent of basic military salary payments. The current equivalent cost of pension obligations is thus in excess of about $15 billion per year. The revisions proposed by the Grace Commission probably would reduce costs to the taxpayer by as much as three-quarters but would similarly reduce the value of benefits to recipients. Leonard also discusses the incentive effects of the current system to determine whether it is having the effect on retention that its proponents desire.

Boskin and Shoven present an examination of some of the issues surrounding the measurement of the well-being of the elderly relative to their previous standard of living, or so-called replacement rates. Among the issues they raise are the treatment of taxes, expenses of raising children, health and health care costs, income uncertainty, and uncertainty about the date of death. They present estimates using alternative assumptions/definitions for various groups in the elderly population. The adjustments that they tentatively propose as reasonable lead to a quite different perception of the adequacy of replacement rates from the traditional measures. They suggest that, for many of the elderly, earnings are virtually fully replaced by Social Security alone; for many more, Social Security replaces a large fraction of earnings; and total post-retirement income usually exceeds pre-retirement income.

Bernheim's paper asks whether wealth typically declines after retirement. He finds that bequeathable wealth declines relatively rapidly for single individuals (roughly 3-4 percent per year), while for couples, the evidence is mixed (slight declines on the order of 1-2 percent per year for early retirees; otherwise, bequeathable wealth remains relatively constant after retirement). After adjusting for annuities (Social Security and pensions), Bernheim concludes that neither single individuals nor couples dissave significant fractions of their total resources after retirement.

Hubbard's paper focuses on the role of uncertainty about the length of one's life in explaining the impact of Social Security on saving. He uses a life-cycle model to show that even an actuarially fair Social Security system reduces the standard of living by more than the tax paid. Moreover, rationing of Social Security annuities, so that low-income individuals receive more than high-income individuals, can generate individual saving rates that rise substantially with income. Depending on the particular way in which participation in Social Security is determined and the extent to which an individual is constrained in capital markets, a wide range of offsets to saving may be traceable to Social Security. Bernheim concludes that focusing only on the wealth effect of anticipated benefits exceeding taxes paid is insufficient to explain the influence of Social Security on household saving.

The final paper, by Kotlikoff, Shoven, and Spivak, examines how the availability of annuities affects savings and inequality in economies in which neither private nor public pensions exist initially. The absence of widespread market or government annuity insurance is clearly descriptive of many less developed countries in the world today; it was also a characteristic of virtually all countries prior to World War II. The paper compares economies with perfect insurance with economies in which completely selfish parents and children pool longevity risk to their mutual advantage. The authors take into account the infinite sequence of risk-sharing bargains of successive parents with their children. Calculations indicate that perfecting annuity insurance can significantly reduce national savings. Indeed, the insurance aspects of government pensions are potentially as important as underfunding those questions in reducing national savings.

The papers presented at the conference and their discussions are expected to be published in an NBER conference volume. Details of its availability will appear in a future issue of the *NBER Reporter*.

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

July 12-13, 1984
Conference on Macroeconomics, NBER

August 5-8, 1984
Annual Meeting, American Agricultural Economics Association*

August 13-16, 1984
Annual Meeting, American Statistical Association*

August 30-31, 1984
Conference on Antitrust and Economic Efficiency, Hoover Institution

September 13-14, 1984
Panel on Economic Activity, Brookings Institution

September 19-22, 1984
Debt/Equity Conference, NBER

September 23-25, 1984
Annual Meeting, National Association of Business Economists*

October 19, 1984
Program Meeting: Economic Fluctuations, NBER

October 19-20, 1984
Third Annual Workshop on U.S.-Canadian Relations, University of Michigan/University of Western Ontario

November 5-7, 1984
Annual Meeting, International Association of Energy Economists*

November 14-16, 1984
Annual Meeting, Southern Economic Association*

November 15-16, 1984
Public Sector Payrolls, NBER

November 25-28, 1984
Annual Conference, National Tax Association*

November 29-December 2, 1984
Exchange Rate Policies and Systems in Developing Countries, NBER/World Bank

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

January 11, 1985
Program Meeting: Economic Fluctuations, NBER

February 8, 1985
Monetary Policy in a Changing Environment, American Enterprise Institute

March 21-25, 1985
Conference on Pensions, NBER

March 28-30, 1985
Annual Meeting, Midwest Economics Association

March 29, 1985
Program Meeting: Economic Fluctuations, NBER

August 4-7, 1985
Annual Meeting, American Agricultural Economics Association*

August 12-15, 1985
Annual Meeting, American Statistical Association*

September 11-14, 1985
17th CIRET Conference, Center for International Research on Economic Tendency Surveys

September 29-October 2, 1985
Annual Meeting, National Association of Business Economists*

November 24-26, 1985
Annual Meeting, Southern Economic Association

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

April 3-5, 1986
Annual Meeting, Midwest Economics Association

July 27-31, 1986
Annual Meeting, American Agricultural Economics Association*

September 13-17, 1986
Annual Meeting, National Association of Business Economists*

December 28-30, 1986
Annual Conference, American Economic Association*

August 2-5, 1987
Annual Meeting, American Agricultural Economics Association*

September 27-October 1, 1987
Annual Meeting, National Association of Business Economists*

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

Tax Group Meets at NBER-West

On March 8 and 9, members and guests of NBER's Program in Taxation met in Palo Alto, California. The agenda for the program meeting was:

Joseph E. Stiglitz, NBER and Princeton University, and Bruce Greenwald, Harvard Business School, "Pecuniary and Market-Mediated Externalities: Towards a General Theory of the Welfare Economics of Economies with Imperfect Information and Incomplete Markets" (NBER Working Paper No. 1304)
Discussant: David Starrett, Stanford University

Kenneth Judd, Northwestern University, "Public Finance Issues in a Perfect Foresight Model"
Discussant: Michael Rothschild, NBER and University of California, San Diego

Michael J. Boskin, NBER and Stanford University, "Estimates of Government Expenditures and Taxes: Conceptual and Measurement Issues in Government Spending and Finance"
Discussant: Laurence J. Kotlikoff, NBER

Jerry A. Hausman, NBER and MIT, and Janice Halpern, Lexecon, "A Model of Disability Insurance"
Discussant: Harvey S. Rosen, NBER and Princeton University

Patric H. Hendershott, NBER and Ohio State University, and Marc Smith, Temple University, "Household Formations and Housing Production"
Discussant: Daniel Feenberg, NBER

Charles Stuart, University of California, Santa Barbara, "Welfare Cost per Dollar of Additional Tax Revenue in the United States"
Discussant: Don Fullerton, NBER and Princeton University

Lawrence H. Summers, NBER and Harvard University, and James M. Poterba, NBER and MIT, "Dividends and Taxes"
Discussant: Roger Hall Gordon, NBER and University of Michigan

The paper by Stiglitz and Greenwald analyzes the impact of informational externalities and simplifies the problem of determining when tax interventions can be Pareto-improving. It also focuses on adverse selection, signaling, moral hazard, incomplete contingent claims markets, and queue-rationing equilibriums. The authors conclude, among other things, that by approaching informational externalities like standard nonpecuniary externalities, one can identify the appropriate direction of policy intervention and observable measures of their successful application.

According to Judd, a major problem in public finance is the construction of models in which one may determine the incidence and welfare cost of various taxes. In his paper, he examines this issue and determines the marginal welfare cost of the taxation of labor and capital, and of the investment tax credit. His analysis shows that the marginal cost of factor taxation may be much higher than commonly thought, and he indicates that the differential costs among various instruments may be quite large.

Boskin's paper focuses on conceptual and measurement issues in the federal budget and on fiscal policy. He divides his subject into four categories: motivations, conceptual issues, measurement issues, and conflicting views on the comprehensiveness and comprehensibility of the federal budget.

According to Hausman and Halpern, a disability, or a health-related inability to work, is more than a medical problem: it also involves motivational and attitudinal factors. Using a model of the application process, Hausman and Halpern analyze the Social Security Disability Insurance (DI) Program and the labor force participation decisions of disabled individuals. Hausman and Halpern note that the DI program does not pay benefits to all disabled adults, mostly because of its strict eligibility requirements. They find that only those with severe mental or physical impairments and solid work records receive DI benefits.

Hendershott's paper notes that there has been a continued increase in housing demand since 1960. He focuses on two reasons for this: first, over the last decade, there has been a belief that housing was unaffordable. Second, income elasticity of housing demand is generally accepted as being less than unity, and real income per capita has doubled in the last quarter century. Thus, Hendershott points out, the housing/wealth ratio should have declined, even without an affordability crisis. His paper studies the reason for this lack of decline and also focuses on the link between household formations and housing production.

Using general equilibrium simulations, Stuart estimates the change in welfare costs (that is, "excess burden") needed to raise a marginal dollar of tax revenue from labor income in the United States. Stuart notes that, given the historical pattern of taxation and government spending, this "marginal excess burden" may be 50 cents or higher per dollar of public revenue at current levels of taxation.

Finally, using British data, Summers and Poterba examine the effects of dividend taxes on investors' relative valuation of dividends and capital gains. In studying Britain's changes and reforms in tax policy, they find an ideal controlled experiment for assessing the effects of various taxes on investors' valuation of dividends. Using daily data on a small sample of firms, and monthly data on a broader sample, Summers and Poterba find evidence that taxes change equilibrium relationships between dividend yields and market returns. They suggest, then, that taxes are important determinants of security market equilibrium. They

also question, even more strongly than before, why firms pay dividends.

Also attending the two-day meeting were: David F. Bradford, NBER and Princeton University; George Break and Daniel Rubinfeld, University of California, Berkeley; George M. Constantinides, NBER and University of Chicago; Jerry R. Green, NBER and Harvard University; Robert E. Hall and John B. Shoven, NBER and Stanford University; Ingemar Hanson, University of Lund; David G. Hartman, NBER; Mordecai Kurz, Stanford University; Peter Mieszkowski, NBER and Rice University; Richard Musgrave, University of California, Santa Cruz; Joseph A. Pechman, Hoover Institution and Brookings Institution; Marc Robinson, University of California, Los Angeles; and Joel Slemrod, NBER and University of Minnesota.

Meeting of Labor Group Held

On April 20, members of NBER's Program in Labor Studies convened in Cambridge to discuss recent research. The day's agenda was:

Katharine G. Abraham, NBER and MIT, and Lawrence Katz, MIT, "Cyclical Unemployment: Sectoral Shifts or Aggregate Demand Fluctuations?"

Charles C. Brown, NBER and University of Maryland, and James L. Medoff, NBER and Harvard University, "Employer Size and the Payment Factors"

Gary Solon, NBER and University of Michigan, and Motty Perry, University of Chicago, "Wage Bargaining, Labor Turnover, and the Business Cycle: A Model with Asymmetric Information" (NBER Working Paper No. 1359)

Steven G. Allen, NBER and North Carolina State University, and Robert L. Clark, North Carolina State University, "The Effects of Unions on Pension Benefits"

In their paper, Abraham and Katz consider two alternative explanations of cyclical fluctuations in the unemployment rate: sectoral shifts in demand and changes in aggregate demand. After estimating equations for unemployment and job vacancy, the authors lean toward the conclusion that fluctuations in aggregate demand, not pure sectoral shifts, have been responsible for most of the observed cyclical movement in unemployment that is associated with movement in the dispersion of growth rates of unemployment. They then develop a model that allows for both sectoral and aggregate shifts in demand to affect cyclical unemployment, but again they find that sectoral shifts are not an important source of these cyclical fluctuations.

Brown and Medoff analyze the well-known positive relationship between the size of the employer and its wage rates. They first describe the various hypotheses that have been developed to explain this correlation and then discuss experiments that might shed new light on the validity of such theories. Next, Brown and Medoff offer evidence on the existence of the size-wage effect; their goal is to provide some new facts that might explain any theory of the differential in wages among firms of different size. Finally, they ask whether the size-wage relationship leads to a negative correlation between size and profitability. Indeed, they find some evidence suggesting that the rate of return on capital may decline with employer size.

Perry and Solon present a model of wage bargaining with bilaterally asymmetric information. Equilibrium outcomes involve both unilateral wage setting and inefficient labor turnover. Their paper also describes how aggregate demand shocks may affect bargaining. The results of their model include procyclical quits, countercyclical layoffs, and quasi-involuntary unemployment. These results do not depend on assumptions of nominal wage rigidity, implicit long-term contracts, or misperceptions of aggregate prices. All that is required is uncertainty by each party of the other's reservation wage and awareness by both parties of the direction of demand shocks.

The final paper, by Allen and Clark, examines the effect of unions on the magnitude and distribution of pension benefits. The authors find that beneficiaries in collectively bargained plans receive larger initial benefits, retire earlier, and get larger post-retirement increases in benefits than others. Another result is that among employees in a pension plan, the union-nonunion compensation gap narrows more rapidly over the life cycle than the corresponding earnings gap. This is because the pension benefit structure is more compressed under unionism. Pension coverage is thus an important conditioning factor for understanding how union-nonunion compensation gaps change over the life cycle.

Attending the meeting were NBER associates: John Abowd and Edward P. Lazear, University of Chicago; Joseph G. Altonji and Andrew Weiss, Columbia University; Orley Ashenfelter, James N. Brown, and David Card, Princeton University; David Bloom, Richard B. Freeman, Zvi Griliches, and David A. Wise, Harvard University; William Dickens and Jonathan S. Leonard, University of California, Berkeley; Ronald G. Ehrenberg and Olivia S. Mitchell, Cornell University; Daniel S. Hamermesh and Harry J. Holzer, Michigan State University; David G. Hartman; Casey Ichniowski, MIT; Yannis Ioannides, Boston University; George Johnson, University of Michigan; Boyan Jovanovic, New York University; Shelly Lundberg, University of Pennsylvania; and Thomas L. Steinmeier, Texas Tech University. Also participating were: John Bound, Wayne Gray, and Erica Groshen, Harvard University; Stephen J. Davis, Brown University; Robert Gregory, Australian National University; Morris Kleiner, University of Kansas; Kevin Murphy, University of Chicago; and Andrew J. Oswald and Chris Pissarides, Princeton University.

Trade Policy Group Convenes

Members and guests of NBER's project on trade policy met in Cambridge on April 26–27 to discuss recent research. The agenda for the two days was:

- Paper by Carl Shapiro, Princeton University, on a survey/review of models of research and development (R and D) rivalry with the objective of drawing lessons from the existing theory of R and D competition
- Paper by Avinash K. Dixit, Princeton University, and Albert S. Kyle, NBER and Yale University, on strategic instruments of trade policy with an emphasis on the role of subsidies
- Paper by Paul R. Krugman, NBER and MIT, on industrial policy
- Paper by Therese Flaherty Harvard University, on aspects of strategic behavior and trade policy in the semiconductor industry
- Discussion of the questions William Krist, Office of the U.S. Trade Representative, presented at the end of the December 2, 1983, meeting

The first paper notes that public policy in technologically progressive industries must be based upon an understanding of how rivalry in R and D is played out in the marketplace. Shapiro surveys and reviews the game-theoretic literature on R and D competition with the objective of drawing lessons from the existing theory.

The two major market imperfections in the R and D area are appropriability problems (such as imitation) and the role of market power in rewarding innovation. Two strands of the literature, one dealing with patent races (product innovation) and one dealing with cost reduction games (process innovation), illustrate the theoretical ambiguities that arise as a result of these market failures. The single most important feature that policymakers must determine in a given industry is the degree of appropriability of R and D results.

According to Dixit and Kyle's paper, in high technology industries—such as aerospace and computers—that involve heavy initial sunk costs of development and imperfect competition thereafter, strategic interactions between the trade policy decisions of government and the entry decisions of firms lend themselves to being modeled using a game-theoretic framework. Using a highly simplified model involving two countries and two firms, the authors illustrate these strategic interactions by investigating the effect on outcomes of changes in the order with which trade policy and entry decisions are made. While unambiguous implications for world welfare are hard to come by, there is a general tendency for protection as an instrument of entry promotion to be negative (and countermeasures to deter such a policy positive), and for subsidies as an instrument of entry promotion to be more efficient than protection.

Krugman's paper asks whether the targeted industrial policies of foreign governments are a source of serious harm to the U.S. economy, demanding a toughened U.S. policy response. While foreign targeting probably has significant effects on U.S. trade, this need not imply that U.S. real income is reduced. Serious injury is likely to result only if foreign industrial practices aggravate existing distortions and imperfections in the U.S. economy. The paper uses theoretical analysis, aggregate evidence, and case studies to examine several possible channels through which foreign targeting might be hurting the United States. While each of the channels is a possible source of injury and appears plausible based on casual observation, careful examination of cases does not support the view that any of the channels is actually a source of serious problems. Thus, the paper suggests that the belief that targeted industrial policies abroad are a major problem for the United States may not be justified.

Flaherty's paper points out that technology leadership is often, but not always, associated with market share leadership in high technology industries. She addresses the question of how technology leadership and conventional market resources (service and sales in marketing, local manufacturing presence, and organization) interact and affect market share in a market with a single product.

Field and statistical work in the semiconductor industry suggests that conventional business resources have substantial positive impacts on market share. Moreover, the effect of a lead in technology appears to be large, particularly if leadership is supported with applications engineering and other conventional business resources.

Finally, Krist posed several questions on the semiconductor industry that are also applicable to most high technology industries.

(1) Under what circumstances, and how, should the United States ever retaliate against foreign government subsidies? Should we countervail on the same product, retaliate on another product, match the subsidy, or follow a different strategy?

(2) Does a restricted market access have the effect of a subsidy? How would this be calculated?

(3) Do other practices, such as anticompetitive behavior, have the effect of a subsidy?

(4) Can one calculate the effect of past subsidies and restricted market access on the current trade? How should the government deal with the lingering effects of those practices after they have ceased?

(5) What can be done to prevent foreign targeting practices? Does the game theory suggest a useful approach?

(6) How does one discriminate between forward pricing strategy, predatory pricing, and dumping?

In addition to the authors, the following NBER project members attended the meeting: William H. Branson, Princeton University; David G. Hartman; Alvin Klevorick, Yale University; J. David Richardson, Uni-

versity of Wisconsin; and Barbara J. Spencer, Boston College. Also attending were: Robert Feenstra, Columbia University; Paul Joskow, MIT; Carole E. Kitti, Office of Management and Budget; Kala Krishna, Princeton University; Richard Levin, Yale University; Rolf R. Piekarz and Alan Rapoport, National Science Foundation; Amelia Porges, Office of the U.S. Trade Representative; and Donald Stockdale of Simpson, Thatcher, and Bartlett.

Financial Markets Program Meets

Members and guests of NBER's Program in Financial Markets and Monetary Economics met in Cambridge on May 3 and 4 to discuss recent research. Program Director Benjamin M. Friedman of NBER and Harvard University organized the two-day gathering. The agenda was:

Richard Clarida, NBER and Yale University, "Optimal Money Holdings in the Presence of Liquidity Constraints and Random Income Fluctuations"
Discussant: Carl E. Walsh, NBER and Princeton University

Jeffrey Carmichael, Princeton University and Reserve Bank of Australia, "Testing the Ricardian Equivalence Theorem"
Discussant: John H. Makin, NBER and University of Washington

Robert J. Shiller, NBER and Yale University, "Alternative Interpretations of Stock Price Movements"
Discussant: V. Vance Roley, NBER and University of Washington

Zvi Bodie, NBER and Boston University; Jay O. Light, NBER and Harvard University; Randall Mørck, Harvard University; and Robert A. Taggart, Jr., NBER and Harvard University, "Funding and Asset Allocation in Corporate Pension Plans: An Empirical Investigation" (NBER Working Paper No. 1315)
Discussant: Roger H. Gordon, NBER and University of Michigan

Terry Marsh, NBER and MIT, "Asset Pricing Model Specification and the Term Structure Evidence"
Discussant: Jess B. Yawitz, NBER and Washington University

Clarida's paper examines the optimal spending behavior and money holdings of a risk-averse individual who faces liquidity constraints and random fluctuations in his money income. Because of a cash-in-advance constraint, the individual has a well-defined transactions requirement for money balances. In addition, because money income is uncertain and money is—by assumption—the only available store of value, the risk-averse individual holds money balances as an inventory that can be drawn down in periods of unexpectedly low earnings. Clarida shows that, in the presence of random income fluctuations, the risk-averse individual has a unique target level of money balances that depends directly on the dispersion of the probability distribution that governs these fluctuations. He also establishes the existence, continuity, and properties of the unique probability distributions that characterize the behavior of optimal money holdings and beginning-of-period money balances in a stochastic steady state. Clarida shows that the limiting distribution that characterizes beginning-of-period money balances is continuous and strictly increasing. By contrast, the stationary distribution that characterizes optimal money holdings is shown to be continuous almost everywhere and strictly increasing with a single mass point at zero.

Carmichael's paper reconsiders the methodology involved in testing the Ricardian equivalence theorem and makes two main points. The first is the need to separate permanent and transitory effects of government debt and Social Security. His analysis suggests that, at a minimum, three separate variables are needed to test for the windfall wealth, permanent net wealth, and asset substitution effects of debt and Social Security.

The second, and major, theme of the paper is that the dominant effect of government debt (and, to a lesser extent, Social Security) on capital accumulation is the direct substitution of public for private assets—an effect that cannot be captured adequately in an estimated aggregate consumption function.

Direct estimation of an aggregate capital accumulation equation suggests that the existing Social Security system and the past issue of government debt in place of direct taxes have reduced the capital stock in the United States by around 40 percent.

Shiller's paper presents a broad overview of the evidence in the literature on the determinants of the dramatic and unpredictable price movements that characterize speculative assets. Are markets strictly efficient or are they heavily influenced by fads or fashions? He argues that the literature has been widely misinterpreted and that in fact the weight of the evidence indicates that fads are important in determining asset prices.

The paper by Bodie et al. contrasts and empirically tests two different views of corporate pension policy: (1) the traditional view that pension funds are managed without regard to either corporate financial policy or the interests of the corporation and its shareholders; and (2) the corporate financial perspective represented by recent theoretical work that stresses the potential effects of a firm's financial condition on its pension funding and asset allocation decisions. There are several pieces of evidence supporting the corporate financial perspective. First, there is a significant inverse relationship between firms' profitability and the discount rates they choose when reporting

their pension liabilities. In view of this, the authors adjust all reported pension liabilities to a common discount rate assumption. They then find a significant positive relationship between firm profitability and the degree of pension funding, as is consistent with the corporate financial perspective. There is also some evidence that firms facing higher risk and lower tax liabilities are less inclined to fully fund their pension plans. On the asset allocation question, the distribution of plan assets invested in bonds is bimodal, but it does not tend to cluster around extreme portfolio configurations to the extent predicted by the corporate financial perspective. The percentage of plan assets invested in bonds is negatively related to both total size of plan and the properties of unfunded liabilities. The latter relationship shows up particularly among the riskiest firms and is consistent with the corporate financial perspective on pension decisions.

Marsh develops a set of tests for models of relative asset prices that are central to the financial economics literature. The traditional capital asset pricing model (CAPM), the Breeden consumption CAPM, and the intertemporal CAPM are expressed as nested hypotheses that differ in their implied specification of the econometric model of asset returns. Marsh's tests take account of the nonobservability of consumption or marginal utility variables and are specified so that models of real asset returns can be applied to nominal returns. When applied to the term structure, they support the Breeden consumption CAPM as the most appropriate model.

In addition to those already named, the following NBER economists participated in the meeting: Charles Freedman, Bank of Canada; Glenn Hubbard, Northwestern University; Takatoshi Ito, University of Minnesota; Alex Kane, Boston University; Edward J. Kane, Ohio State University; Albert S. Kyle, Princeton University; James M. Poterba, MIT; Robert H. Rasche, Michigan State University; and James A. Wilcox, University of California, Berkeley. Also attending were Diane Coyle, Jeffrey C. Fuhrer, and Ken Weiller, Harvard University.

Trade Report Published This Spring

"Strategic U.S. Trade Policy: A Survey of Issues and Early Analysis," by NBER Research Associates Gene M. Grossman and J. David Richardson, was published this spring in Cambridge. This NBER Research Progress Report, the second to result from NBER's project on trade policy, was supported by National Science Foundation Grant PRA-8116459.

The 35-page pamphlet includes discussion of trade policy in imperfectly competitive environments, and response and counter-response in a strategic trade policy environment. This publication is available in limited quantity and free of charge. Your written request, specifying title and author, should be sent to: Research Progress Report, NBER, 1050 Massachusetts Avenue, Cambridge, MA 02138.

Report on Pensions Available

"Pensions and the Labor Market," an NBER Summary Report by Research Associate David A. Wise, is now available in limited quantity, free of charge. This 24-page pamphlet is an edited version of the introductory chapter of the forthcoming NBER volume, *Pensions, Labor, and Individual Choice*. It briefly covers such topics as: trends in pension coverage and labor force participation; the structure of plans and their potential effects on incentives; the determinants of pension coverage; and the impact of pensions on labor force participation.

To receive a copy of this report, please refer to it by title and author. Send your request to: Summary Report, NBER, 1050 Massachusetts Avenue, Cambridge, MA 02138.

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Policy Evaluation and Design for Continuous-Time, Linear Rational Expectations Models: Some Recent Developments

Willem H. Buiter
Technical Working Paper No. 34
April 1984
JEL Nos. 130, 213

The paper surveys some recent developments in policy evaluation and design in continuous-time, linear rational expectations models. Much recent work in macroeconomics and open-economy macroeconomics fits into this category. First, I review the continuous-time analogue of the discrete-time solution method of Blanchard and Kahn. Then I discuss some problems associated with this solution method, including non-uniqueness and zero roots. The paper derives optimal (but generally time-inconsistent) and time-consistent (but generally suboptimal) solutions to the general linear-quadratic optimal control problem, based on work by Calvo, Driffill, Miller and Salmon, and Buiter. Finally, I solve a numerical example involving optimal and time-consistent anti-inflationary policy design in a contract model.

Misperceptions, Moral Hazard, and Incentives in Groups

Martin Gaynor
Technical Working Paper No. 35
April 1984
JEL No. 913

Recent work has shown that, in the presence of moral hazard, balanced budget Nash equilibriums in groups

are not Pareto optimal. This work shows that when agents misperceive the effects of their actions on the joint outcome, a set of sharing rules exist that balance the budget and lead to a Pareto optimal Nash equilibrium.

Conditional Projection by Means of Kalman Filtering

Richard H. Clarida and **Diane Coyle**
Technical Working Paper No. 36
May 1984

We establish that the recursive, state-space methods of Kalman filtering and smoothing can be used to implement the Doan, Litterman, and Sims (1983) approach to econometric forecast and policy evaluation. Compared with the methods outlined in Doan, Litterman, and Sims, the Kalman algorithms are more easily programmed and modified to incorporate different linear constraints, to avoid cumbersome matrix inversions, and to provide estimates of the full variance-covariance matrix of the constrained projection errors that can be used directly, under standard normality assumptions, to test statistically the likelihood and internal consistency of the forecast under study.

Errors in Variables in Panel Data

Zvi Griliches and **Jerry A. Hausman**
Technical Working Paper No. 37
May 1984

Panel data based on various longitudinal surveys have become ubiquitous in economics in recent years. Estimation using the analysis of covariance approach allows for control of various "individual effects" by estimation of the relevant relationships from the "within" dimension of the data. Quite often, however, the "within" results are unsatisfactory, "too low," and insignificant. Errors of measurement in the independent variables, whose relative importance gets magnified in the within dimension, are often blamed for this outcome.

However, the standard errors-in-variables model has not been applied widely, partly because, in the usual micro data context, it requires extraneous information to identify the parameters of interest. In the panel data context a variety of errors-in-variables models may be identifiable and estimable without the use of external instruments. We develop this idea and illustrate its application in a relatively simple but interesting case: the estimation of "labor demand" relationships, also known as the "short-run increasing returns to scale" puzzle.

Correcting for Truncation Bias Caused by a Latent Truncation Variable

David E. Bloom and **Mark R. Killingsworth**
Technical Working Paper No. 38
June 1984
JEL No. 211

We discuss estimation of the model:

$$Y_i = X_i b_Y + e_{Yi}$$
$$T_i = X_i b_T + e_{Ti}$$

when data on the continuous dependent variable, Y, and on the independent variables, X, are observed if and only if the "truncation variable" T is greater than zero and is latent. This case is distinct from: (1) the "censored sample" case, in which Y data are available if and only if T is greater than zero, T is latent, and X data are available for *all* observations; and (2) the "observed truncation variable" case, in which both Y and X are observed if and only if T is greater than zero and the actual value of T is observed whenever T is greater than zero. We derive a maximum-likelihood procedure for estimating this model and discuss identification and estimation.

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Journal of Economic Literature (JEL) subject codes, when available, are listed after the date of the Working Paper. Abstracts of all Working Papers issued since March 1984 are presented below. For previous Working Papers, see past issues of the *NBER Reporter*. The Working Papers are intended to make results of NBER research available to other economists in preliminary form to encourage discussion and suggestions for revision before final publication. Working Papers are not reviewed by the Board of Directors of NBER.

Open-Economy Implications of Two Models of Business Fluctuations

Alan C. Stockman and **Ai Tee Koh**
Working Paper No. 1317
March 1984
JEL No. 431

This paper shows how open-economy implications of alternative business-cycle models can be used to discriminate between those models. Open-economy versions of two well-known models are presented: a model with predetermined nominal wages and a model in which nominal disturbances are misperceived as real disturbances. In the former model applied to a small economy with flexible exchange rates, an unanticipated increase in the money supply increases output of both traded and nontraded goods, lowers the relative price of nontraded goods, and induces a surplus in the current account. In the latter model, an unperceived increase in the money supply increases output of nontraded goods but reduces output of traded goods, raises the relative price of nontraded goods, and induces a deficit in the current account.

Optimal Price Adjustment with Time-Dependent Costs

Joshua Aizenman
Working Paper No. 1319
April 1984
JEL No. 310

This paper analyzes an optimal pricing rule when the costs of price adjustment are time dependent, and where those costs depend positively on the magnitude of the percentage change in prices. By means of a discrete-time model, it shows that the optimal response to the problem is to preset prices for each period at the end of the previous period. Within the period, prices will adjust if the unexpected shock exceeds a threshold level. In such a case, the new price is the weighted average of the preset price and the equilibrium price that would have obtained in the absence of costs of contemporaneous price adjustment. Under certain conditions, which are derived in the paper, higher volatility of unexpected inflation might reduce relative price volatility.

The Heights of Europeans since 1750: A New Source for European Economic History

Roderick Floud
Working Paper No. 1318
April 1984
JEL Nos. 910, 044

Economic and social historians traditionally have been concerned with measuring changes in the past income and welfare of populations. Until recently, however, they have not recognized that anthropometric data, such as evidence on the average height of a population at a particular age, provide sensitive indicators of the average nutritional status of that population. Records of conscription into the armies of 11 European countries between 1761 and 1975 provide 144 observations of mean height. Using 64 observations, this paper explores the relationship between mean height and other indicators of health and welfare, in particular the level of GDP per capita and the level of infant mortality. Western European heights have responded systematically over the past 100 years to changes in income and disease, just as heights in the modern world respond to such changes today. Average height presents powerful evidence of the nature and extent of economic development.

Technological and Regulatory Forces in the Developing Fusion of Competition in Financial Services

Edward J. Kane
Working Paper No. 1320
April 1984
JEL No. 313

Product lines of traditionally heterogeneous financial institutions are rapidly fusing into a homogeneous blend. Institutions and market structures are reshaping themselves to lower the cost of serving customer demand for financial services. This paper contends that contemporary adaptations exploit economies of scope rooted in technological change and deposit insurance subsidies to innovative forms of risk bearing.

As they reorient work flows, financial firms are simultaneously restructuring their organizations to lower net burdens of government regulation. Alternative state and federal regulatory and legislative bodies compete vigorously for the regulatory business of developing institutional hybrids. Evolution of Federal Reserve policy toward "nonbank banks" exemplifies the process.

Trade Policy, Income, and Employment

Robert E. Baldwin
Working Paper No. 1321
April 1984

Disappointing recent growth rates, the emergence of structurally unfavorable income and employment conditions, and important institutional changes in the international trading environment have caused policy officials in the advanced industrial nations to reconsider the proper mix of reactive versus active trade policy in easing adjustment to labor market disruptions and dealing with structural changes. This paper first examines the implications of traditional trade theory along with the new theoretical developments that emphasize imperfect markets for this policy reevaluation. I then consider alternative policy options within a framework that recognizes the imperfect real world conditions within which trade policies must operate.

Social Security and Pensions

Edward P. Lazear
Working Paper No. 1322
April 1984

Recent and proposed changes in the Social Security statutes can have profound effects on worker behavior and on pensions themselves. In the context of an optimal lifetime compensation plan, pensions depend on efficient dates of retirement. To the extent that changes in Social Security affect the efficient date of retirement, both the pension and the wage profile itself will react. I analyze four proposed changes in the Social Security system and then discuss the cost savings associated with each change, as well as its effect on pensions and on worker compensation in general.

The Informational Content of Bond Ratings

Louis H. Ederington, Brian E. Roberts, and **Jess B. Yawitz**
Working Paper No. 1323
April 1984

This paper explores the risk structure of interest rates. More specifically, we ask whether yields on industrial and commercial bonds indicate that market participants base their evaluations of a bond issue's default risk on agency ratings or on publicly available financial statistics. Using a nonlinear, least-squares procedure, we relate the yield to maturity to Moody's rating, Standard & Poor's rating, and accounting measures of creditworthiness such as coverage and leverage. We find that market yields are significantly correlated with both the ratings and with a set of readily available financial accounting statistics. These results indicate: (1) that market participants base their evaluations of the creditworthiness of an issue on more than the agencies' ratings; and (2) that the ratings bring some information to the market above and beyond that contained in the set of accounting variables. In addition, our results suggest that the market views Moody's and S&P's ratings as equally reliable measures of risk. Although the accounting measures also affect yields on new or recently reviewed issues, our analysis suggests that the market may pay more attention to the accounting measures and less to the ratings if the ratings have not been reviewed recently.

Capital Controls, the Dual Exchange Rate, and Devaluation

Maurice Obstfeld
Working Paper No. 1324
April 1984
JEL No. 431

This paper reexamines the effect of devaluation under capital-account restrictions, adding to traditional formulations the seemingly minor (but realistic) assumption that central bank reserves earn interest. The extra assumption has important implications. In an intertemporal model, devaluation is no longer neutral in the long run as it is in the literature on the monetary approach to the balance of payments. Further, the economy may possess multiple stationary states, some of them unstable.

The analysis confirms, however, that even large devaluations must improve the balance of payments if the economy is initially at a stable stationary position. A by-product of the analysis is a pricing formula for the financial exchange rate in a dual exchange rate system. That formula is consistent with recent consumption-based models of asset pricing.

Cyclical Behavior of Prices and Quantities in the Automobile Market

Olivier J. Blanchard and **Angelo Melino**
Working Paper No. 1325
April 1984
JEL Nos. 130, 630

This paper has a simple goal: understanding the joint behavior of prices and quantities in a particular market.

More precisely, it examines whether we can find decision problems for suppliers and buyers, with a market equilibrium structure, that are consistent with the observed price and quantity time series. Because of the relative homogeneity of the product, of the size of the market, and of the quality of the data, we chose the automobile market.

The first conclusion we reach is that this goal is difficult to achieve. The behavior of prices appears inconsistent with simple—competitive, monopolistically competitive, or monopolistic—market structures. Prices appear, in a well-defined sense, to be too "sticky."

We then consider potential explanations and extensions. None appears completely satisfactory. In particular, the introduction of costs of changing prices does not seem to explain the joint behavior of prices and quantities.

The Lucas Critique and the Volcker Deflation

Olivier J. Blanchard
Working Paper No. 1326
April 1984
JEL Nos. 130, 310

This paper examines the behavior of the Phillips curve and of the term structure of interest rates after 1979, in light of the Lucas Critique. It starts with an informal account of the policy change and then discusses how we might expect these two relations to shift after such a change. The paper finds little evidence of a direct effect of the policy change on the Phillips curve, at least until 1982, but finds substantial evidence of a direct effect on term structure.

Splitting Blacks? Affirmative Action and Earnings Inequality Within and Across Races

Jonathan S. Leonard
Working Paper No. 1327
April 1984
JEL No. 820

Critics have said that Affirmative Action is at best ineffective and at worst counterproductive. In particular, it has been argued that if Affirmative Action helps anybody, it helps only the highly educated cream of the minority population, and it may work perversely to the detriment of the unskilled and uneducated. This study finds that minority males earn higher wages in sectors where Affirmative Action is prevalent, suggesting that Affirmative Action has increased the demand for minority males. I also find evidence of this effect for both the poorly and the well educated, suggesting that Affirmative Action under the Executive Order has not contributed to the economic bifurcation of the minority community.

Affirmative Action as Earnings Redistribution: The Targeting of Compliance Reviews

Jonathan S. Leonard
Working Paper No. 1328
April 1984
JEL No. 820

Affirmative Action may be broadly conceived of as pursuing either the goal of reducing discrimination or that of redistributing jobs and earnings. I attempt to infer the goal of Affirmative Action policy by analyzing the historical record of enforcement. After developing optimal enforcement strategies for both the models of anti-discrimination and of earnings redistribution, I compare them with new data on the actual targeting of Affirmative Action compliance reviews during the late 1970s. I find that establishments with very low proportions of minority or female workers are not significant ly more likely to be reviewed, but that establishments with many white collar workers are more likely to be reviewed. This indicates the shortcomings of the anti-discrimination model in explaining the OFCCP's behavior and suggests the potential usefulness of the earnings redistribution model.

Optimal Wage Indexation, Foreign Exchange Intervention, and Monetary Policy

Joshua Aizenman and **Jacob A. Frenkel**
Working Paper No. 1329
April 1984
JEL Nos. 430, 310

This paper deals with the design of optimal monetary policy and with the interaction between the optimal degrees of wage indexation and foreign exchange intervention. The model is governed by the characteristics of the stochastic shocks that affect the economy and by the information set that individuals possess. Because of the cost of negotiations, nominal wages are assumed to be precontracted and wage adjustments follow a simple indexation rule linking wage changes to observed changes in price. The use of the price level as the only indicator for wage adjustments may not permit an efficient use of available information and may result in welfare loss. The analysis specifies the optimal set of feedback rules that should govern policy aimed at minimizing the welfare loss. These feedback rules determine the optimal response of monetary policy to changes in exchange rates, interest rates, and foreign prices. The adoption of the optimal set of feedback rules results in the complete elimination of the welfare cost that arises from the simple indexation rule

and from the existence of nominal contracts. Since optimal policies succeed in the elimination of the distortions, issues concerning the nature of contracts and the implications of specific assumptions about disequilibrium positions become inconsequential.

The analysis then proceeds to examine the interdependence between the optimal feedback rules and the optimal degree of wage indexation. We show that a rise in the degree of exchange rate flexibility raises the optimal degree of wage indexation. One of the key conclusions is the proposition that the number of independent feedback rules that govern a policy must equal the number of independent sources of information that influence the determination of the undistorted equilibrium. Thus, we show that with a sufficient number of feedback rules for monetary policy there may be no need to introduce wage indexation. We also show that an economy that is not able to choose an exchange rate regime freely can still eliminate the welfare loss by supplementing the (constrained) monetary policy with an optimal rule for wage indexation. The paper concludes with an examination of the consequences of departures from optimal policy by comparing the welfare loss resulting from the imposition of alternative constraints on the degree of wage indexation, on foreign exchange intervention, and on the magnitudes of other policy feedback coefficients.

Recent U.S. Trade Policy and Its Global Implications

Robert E. Baldwin and **J. David Richardson**
Working Paper No. 1330
April 1984
JEL Nos. 400, 420

This paper describes U.S. trade policy since World War II and assesses the possibility for ongoing U.S. leadership in trade policy. U.S. trade policy has shown remarkable consistency since World War II. It has never been as purely focused on free trade as some commentators suggest, but it has not shifted recently toward isolationism as dramatically as alarmists fear. It has almost always been best described as "open but fair," with injury to import competitors being the measure of "fairness." The general consistency of U.S. trade policy over time is quite remarkable given the frequent change of political party in power, especially in the executive branch, but also in the Congress.

U.S. leadership in trade policy still seems potentially strong despite a decline in U.S. hegemony. It is clearly strong in a protectionist direction. Any shift toward aggressive insularity justifies parallel trade policy aggression in the eyes of trading partners. It is arguably strong in a liberalizing direction as well. The United States seems ideally poised for aggressive trade policy peacemaking, perhaps multilaterally, but perhaps also bilaterally; perhaps with its traditional industrial trading partners, but perhaps also with Japan and newly industrializing Asian countries that play so important a role in U.S. trade, and who, on many matters, may be closer in spirit to U.S. economic philosophy than to Europe's, Canada's, or Latin America's.

Regulatory Structure in Futures Markets: Jurisdictional Competition among the SEC, the CFTC, and Other Agencies

Edward J. Kane
Working Paper No. 1331
April 1984
JEL No. 313

This paper studies competition among alternative regulatory bodies for authority over innovative financial contracts. In the United States, this rivalry embraces not only the Commodity Futures Trading Commission and the Securities and Exchange Commission but also state and federal deposit institution regulators and various private regulatory cooperatives. From a political perspective, multiple regulators develop as a way of formally providing ongoing protection for the interests of diverse political constituencies. But from an economic perspective, competition resulting from overlaps in regulatory responsibility establishes an evolutionary mechanism for adapting regulatory structures to technological and regulation-induced innovation. Using both perspectives, this paper explains how interaction between governmental regulatory agencies and self-regulatory cooperatives produces more efficient regulatory structures over time.

The study also seeks to catalog the particular costs and benefits that may be associated with the regulatory tools used to control futures and securities markets (for example, broker and trader registration, disclosure requirements, margin requirements, and contract-approval processes) and with changes in the distribution of jurisdiction over these tools. The analysis seeks to clarify the trade-off between the perceived probability of various problems of market performance (for example, contract nonperformance, widespread financial instability, and activities such as price manipulation by which corrupt or sophisticated operators separate naive investors from their wealth) and the implicit and explicit cost of reducing this probability.

Measuring Aspects of Fiscal and Financial Policy

Willem H. Buiter
Working Paper No. 1332
April 1984
JEL Nos. 321, 223, 224

This paper develops a forward-looking, comprehensive accounting framework for the public sector. By integrating the public sector budget constraint forward in time, one can obtain the government's present value budget constraint (PVBC). In addition to the familiar financial assets and liabilities, comprehensive public sector net worth contains the following items: the value of the public sector capital stock; the value of public sector property rights in land and natural resources; the present value of future seigniorage; the present value of future taxes net of transfers and subsidies; and the present value of future planned public sector capital formation, privatization, or nationalization programs.

From the "stock" PVBC a number of different "flow" deficit concepts can be derived; each one emphasizes a different aspect of the "sustainability" of current and/or prospective fiscal and financial plans. Together they provide a framework for organizing facts and plans about fiscal, financial, and monetary policy and for evaluating the consistency of spending and revenue projections or scenarios, public sector debt objectives, and monetary targets.

Inflation and Real Interest Rates on Assets with Different Risk Characteristics

John Huizinga and **Frederic S. Mishkin**
Working Paper No. 1333
April 1984

Several recent studies find that ex ante real returns on short-term U.S. Treasury securities are negatively correlated both with inflation and with nominal interest rates. This paper asks whether these findings extend to the short-term holding return on publicly and privately issued securities of longer maturity, are robust with respect to the choice of price index, and are stable over time. Our results show that before 1979 a negative relationship of ex ante real returns with inflation and nominal interest rates does appear for the longer maturity assets. In fact, the relationship grows stronger with increases in maturity length. This suggests that although short-term U.S. Treasury bills were, of all the assets we study, the best hedge against expected inflation, none of the assets was a perfect hedge. We find a statistically significant change in the stochastic process of bond returns in 1979, with nominal interest rates and ex ante real holding returns being positively correlated in this latter period. This is not true for stocks, however. While the above results are robust to the choice of price index, we show that estimating the level of ex ante real returns depends crucially on the price index chosen.

The Architecture of Economic Systems: Hierarchies and Polyarchies

Raaj Kumar Sah and **Joseph E. Stiglitz**
Working Paper No. 1334
April 1984
JEL Nos. 020, 053, 511

This paper presents some new perspectives on the structure and performance of alternative economic organizations. We posit that decisionmakers make errors of judgment (for example, they sometimes select bad projects while rejecting good projects), and that how these errors are aggregated within different organizations depends on their architecture (for example, on how individuals are organized together). Using this framework, we compare the performances of two polar forms of organizations: hierarchies and polyarchies.

Assuming that judgmental abilities of individuals are similar in the two systems, we show that polyarchies accept a larger proportion of bad projects (compared to hierarchies), whereas hierarchies reject a larger proportion of good projects. We then determine the conditions under which polyarchies have higher or lower expected profit. The conditions under which polyarchies perform better appear to be more plausible and, moreover, this conclusion holds also in the case where the rules for accepting or rejecting projects are rationally determined based on the information available to individuals. The architecture of organizations also affects their portfolio of available projects; we determine conditions under which polyarchies have better or worse portfolios compared to those available to hierarchies.

There are many possible extensions of our approach. Among them are the analysis of internal structure of firms, selection of managers (by other managers), and the reproduction and self-perpetuation of organizations over time.

Informational Imperfections on the Capital Market and Macroeconomic Fluctuations

Bruce Greenwald, Joseph E. Stiglitz,
and **Andrew Weiss**
Working Paper No. 1335
April 1984
JEL Nos. 131, 023, 520

This paper describes the role that informational imperfections in capital markets are likely to play in business cycles. It then develops a simple illustrative model of the impact of adverse selection in the equity market and the way in which this may lead to large fluctuations in the effective cost of capital in response to relatively small demand shocks. The model also derives an expression for the cost of equity capital in the presence of adverse selection and provides informational explanations for several widely observed macroeconomic phenomena.

External Debt, Budget Deficits, and Disequilibrium Exchange Rates

Rudiger Dornbusch
Working Paper No. 1336
April 1984

This paper investigates the sources of debt and debt-related difficulties for a group of Latin American countries. I argue that external shocks—oil, interest rates, world recession, and the fall in real commodity prices—by themselves cannot account for the problems. Budget deficits that accommodate deterioration in the terms of trade and disequilibrium exchange rates are central to a complete explanation. The paper documents that in Chile an extreme currency overvaluation led to a massive shift into imported consumer durables while in Argentina overvaluation in conjunction with financial instability led to large-scale capital flight. In the case of Brazil the budget deficit is the explanation for the growth in external indebtedness. The difference in the experience of the three countries reflects the difference in their openness to the world economy.

Equilibrium Wage Distributions

Joseph E. Stiglitz
Working Paper No. 1337
April 1984
JEL Nos. 023, 026, 820

This paper analyzes equilibrium in labor markets with costly search. Even in steady-state equilibrium, identical labor may receive different wages; this may be the case even when the only source of imperfect information is the inequality of wages that the market is perpetuating. When there are information imperfections arising from (symmetric) differences in nonpecuniary characteristics of jobs and preferences of individuals, in general there will not exist a full-employment, zero-profit, single-wage equilibrium.

There are, in general, a multiplicity of equilibriums. Equilibrium may be characterized by unemployment; in spite of the presence of an excess supply of labor, no firm is willing to hire workers at a lower wage. It knows that if it does so, the quit rate will be higher, and hence turnover costs (training costs) will be higher, so much so that profits will actually be lower. The model thus provides a rationale for real wage rigidity. The model also provides a theory of equilibrium frictional unemployment.

Although the constrained optimality (explicitly taking into account the costs associated with obtaining information and search) may entail unemployment and wage dispersion, the levels of unemployment and wage dispersion in the market equilibrium will not, in general, be (constrained) optimal.

Taxation and Pricing of Agricultural and Industrial Goods

Raaj Kumar Sah and **Joseph E. Stiglitz**
Working Paper No. 1338
April 1984
JEL Nos. 120, 422, 713

This paper presents an analysis of price reform and of optimal pricing and taxation of agricultural and industrial goods in modern-day LDCs. Our analysis is based on a general equilibrium paradigm with a multitude of goods and income groups. It is consistent with several alternative institutional structures within the agricultural and the industrial sectors, as well as with alternative hypotheses concerning unemployment and migration of labor across the two sectors. This approach differs substantially from the standard tax literature with regard to the structure of the economy and the set of admissible taxes.

The rules of price reform that we derive are quite simple to implement, requiring only the knowledge of observable parameters such as price elasticities of demand and supply. The determination of optimal prices (and taxes) requires, in addition, the relative welfare weights on individuals' incomes and on investment. We show that it is desirable, in general, to levy import and export taxes. Our results include conditions under which all of the goods belonging to certain categories (such as all purchased agricultural inputs or all agricultural outputs that are not consumed) should be either taxed or subsidized.

Contracts, Credibility, and Disinflation

Stanley Fischer
Working Paper No. 1339
April 1984

Estimates of the cost of disinflation made before the recent reduction in the inflation rate varied widely. Estimates were made in terms of the sacrifice ratio—the percentage points of GNP (at an annual rate) lost per percentage point of reduction in the inflation rate. At one extreme it was argued that a resolute and credible monetary policy could reduce inflation at virtually no cost. At the other extreme were estimates that the sacrifice ratio exceeded 10.

Costless immediate disinflation is not possible in an economy with long-term labor contracts. This paper sets out a simple contracting model of wage and output determination and uses it to calculate sacrifice ratios for a disinflation program, under the assumption that announced policy changes are immediately believed. Under this assumption, disinflation with a structure of labor contracts such as those of the United States would be less costly than typically estimated. The model is then modified to allow for the slow adjustment of expectations of policy to actual policy; sacrifice ratios then approach the ranges typically estimated.

The sacrifice ratio for the current disinflation is calculated in the last section: the current disinflation was somewhat more rapid and less costly than previous estimates suggested. The calculated sacrifice ratio is consistent with the predictions of the simple contracting model.

Patents as Options: Some Estimates of the Value of Holding European Patent Stocks

Ariel Pakes
Working Paper No. 1340
April 1984
JEL Nos. 212, 620

In many countries patentholders must pay an annual renewal fee in order to keep their patents in force. This paper uses data on the proportion of patents renewed and the renewal fees faced by post-World War II cohorts of patents in France, the United Kingdom, and Germany. In conjunction with a model of patentholders' renewal decisions, these data are used to estimate the returns earned from holding patents in these countries. Since patents are often applied for at an early stage in the innovation process, agents may be uncertain about the sequence of returns that will be earned if the patent is kept in force. Formally, then, the paper presents and solves a discrete-choice, optimal, stochastic model, derives the implications of the model on aggregate behavior, and then estimates the parameters of the model from aggregate data. The estimates enable a detailed description and calculation of: (1) the evolution of the distribution of returns from holding patents over their lifespans; (2) the annual returns earned from holding the patents still in force (or the patent stocks) in the alternative countries; and (3) the distribution of the discounted value of returns earned from holding the patents in a cohort.

Excess Sensitivity of Consumption to Current Income: Liquidity Constraints or Myopia?

Marjorie Flavin
Working Paper No. 1341
May 1984
JEL No. 131

Almost all of the recent empirical tests of the rational expectations-permanent income hypothesis (RE-PIH) have resulted in its rejection. The null hypothesis in this empirical literature typically consists of the following assumptions: (1) agents' expectations are formed rationally; (2) desired consumption is determined by permanent income; and (3) capital markets are "perfect" in the sense that agents can lend or borrow against expected future income at the same interest rate. This paper attempts to determine whether the excess sensitivity of consumption to current income is caused by a failure of the third of these components—the assumption of "perfect" capital markets—or a failure of one or both of the first two assumptions.

The paper examines, as a specific alternative to the PIH, a simple "Keynesian" consumption function in which the behavioral marginal propensity to consume (MPC) out of transitory income is different from zero. Interpreting the unemployment rate as a proxy for the proportion of the population subject to liquidity constraints, the paper uses a generalized version of the econometric model in my earlier paper (1981) to conduct a specification test of the "Keynesian" consumption function. I find that the estimate of the MPC out of transitory income is dramatically affected, in both magnitude and statistical significance, by the inclusion of the proxy for liquidity constraints. This finding suggests that liquidity constraints are an important part of the explanation of the observed excess sensitivity of consumption to current income.

The Roles of the Terms of Trade and Nontraded-Good Prices in Exchange Rate Variations

Alan C. Stockman and **Harris Dellas**
Working Paper No. 1342
May 1984
JEL No. 431

This paper demonstrates that disturbances to supplies of or demands for internationally traded goods affect exchange rates differently than do disturbances in markets for nontraded goods. The paper develops a stochastic, two-country equilibrium model of exchange rates, asset prices, and goods prices, with two internationally traded goods and a nontraded good in each country. Optimal portfolios differ across countries because of differences in consumption bundles. Changes in exchange rates, asset prices, and goods prices occur in response to underlying disturbances to supplies of and demands for goods. We examine the ways in which responses of the exchange rate are related to parameters of tastes and production shares, and we discuss conditions under which these exchange rate responses are "large" compared to the responses of ratios of nominal price indexes.

The 1981–82 Velocity Decline: A Structural Shift in Income or Money Demand?

Robert J. Gordon
Working Paper No. 1343
May 1984
JEL No. 310

The velocities of both M1 and M2 appear to have experienced sharp and persistent downward shifts during 1981 and 1982. I reexamine the implications of this shift within the context of previous literature on quarterly econometric equations explaining the demand for money.

The traditional specification of money demand equations popularized by Chow and Goldfeld relates real balances to output, interest rates, and lagged real balances, all expressed as log levels. A consistent finding has been a large coefficient on the lagged dependent variable. While this has been interpreted as indicating substantial adjustment costs in portfolio behavior, it is also consistent with lags or "inertia" in price adjustment caused by the presence of long-term wage and price contracts. The fact that the traditional Chow-Goldfeld money demand specification encountered large post-sample prediction errors at the time of the first oil shock in 1973–75 may suggest that a new interpretation of adjustment costs is required. It may be costly to adjust nominal balances by shifting to alternative assets, but it is costless for agents to allow real balances to shrink in response to an unanticipated price shock, as in 1973–75.

A substantial amount of evidence is provided on the relationship between money, income, and interest rates, using alternative dynamic specifications. The post-1973 prediction error in a demand equation for M1 is reduced by three-quarters when the equation is specified in nominal first-difference form rather than in the form of real levels in logs. Results indicate much smaller post-1979 prediction errors for equations describing "simple-sum" M2 than for simple-sum M1, Divisia M1, or for Divisia M2 measures of the money supply.

Targeted Export Promotion with Several Oligopolistic Industries

Avinash K. Dixit and **Gene M. Grossman**
Working Paper No. 1344
May 1984
JEL Nos. 422, 616

In this paper we ask whether a policy of targeted export promotion can raise domestic welfare when several oligopolistic industries draw on the same scarce factor of production. Our point of departure is one of Cournot duopoly in which a single home firm competes with a single foreign firm in a market outside the home country. It has been shown previously that when there is only one such industry in an otherwise perfectly competitive world economy, a subsidy policy by the home government transfers profits to the domestic firm and thereby raises domestic welfare. However, when many such industries (and only these) utilize the same inelastically supplied resource, promotion of one bids up the return to the specific factor and consequently disadvantages all of the nontargeted industries in their respective duopolistic competitions. Our question then is which industries, if any, are worthy of promotion.

We find that, when the specific factor is used in fixed proportion to output and all of the duopolies have similar demand and cost conditions, a policy of free trade is optimal. We identify the conditions for welfare improvement when a single industry is selected for targeting under asymmetric conditions and also investigate whether a uniform subsidy to all industries in the imperfectly competitive sector will raise domestic welfare.

Do Long-Term Interest Rates Overreact to Short-Term Interest Rates?

N. Gregory Mankiw and **Lawrence H. Summers**
Working Paper No. 1345
May 1984

By studying the term structure of interest rates, this paper examines the hypothesis that financial markets are myopic. While decisively rejecting the traditional expectations hypothesis of the term structure, we conclude from our statistical results that long-term interest rates do not overreact to either the level of or the change in short-term rates. This finding suggests that participants in bond markets are not myopic or overly sensitive to recent events. Our statistical results also suggest that most variations in the yield curve reflect changes in liquidity premiums rather than expected changes in interest rates.

What Promises Are Worth: The Impact of Affirmative Action Goals

Jonathan S. Leonard
Working Paper No. 1346
May 1984
JEL No. 820

Affirmative Action goals and timetables for the employment of minorities and females have been criticized by some as being ineffective and by others as being a system of rigid quotas. Using new data from OFCCP administrative records, this paper estimates the impact of detailed regulatory pressure on goals and on subsequent employment demographics. It also tests for the information content of the goals.

While the goals are inflated and are not being fulfilled with the rigidity one might expect of quotas, the establishments that promise to employ more minorities and females actually do employ more in subsequent years. The detailed enforcement tools of the compliance review program are of doubtful utility, but the system of Affirmative Action goals does appear to have prompted increases in minority and female employment at the establishments reviewed.

The Inefficiency of Marginal-Cost Pricing and the Apparent Rigidity of Prices

Robert E. Hall
Working Paper No. 1347
May 1984
JEL Nos. 022, 023

Under conditions of natural monopoly, private contracts or government regulation may attempt to avoid inefficiency by setting up a pricing formula. Once the capital stock is chosen, the right price to charge the buyer is marginal cost. But the point of this paper is that marginal-cost pricing provides the wrong incentives for the choice of the capital stock by the seller. If the seller can achieve a high price by deliberately underinvesting and driving up marginal cost, there will be a systematic tendency toward too small a capital stock. One type of contract or regulatory policy that avoids this problem charges marginal cost to each buyer but provides a revenue to the seller that is equal to long-run unit cost, not short-run marginal cost. Such a contract or policy will make the price, in the sense of the revenue of the seller per unit of output, appear to be unresponsive to market conditions.

The Effects of Social Security Reforms on Retirement Ages and Retirement Incomes

Gary S. Fields and **Olivia S. Mitchell**
Working Paper No. 1348
May 1984
JEL No. 800

Recent changes legislated in the U.S. Social Security system are changing the economic incentives to work and to retire. Some older workers will respond to these new incentives by retiring at different ages. This paper evaluates the signs and magnitudes of workers' responses. Using a representative sample of male workers, we investigate the prereform earnings, private pensions, and Social Security profiles available at alternative retirement ages. Then we examine four specific changes in the structure of Social Security benefits: raising the normal retirement age, delaying the cost-of-living adjustment, lowering early retirement benefits, and increasing late retirement payments. We estimate behavioral parameters using an ordered logit model of retirement ages; these ages are then used to evaluate how retirement behavior might respond to each of the four reforms. The largest response in retirement age occurs with the policy change that cuts benefits at the earliest ages and offers large rewards for continued work. This change would delay the average retirement age by about three months. The other reforms generate smaller responses. Changes in retirement ages of this size will be too small to compensate retirees for reductions in benefit formulas. Thus the Social Security's financial burden will be eased but retirees' incomes will fall on average.

Macroeconomic Evidence on the Composition of Effective Household Savings during the 1960s and 1970s

Edward J. Kane
Working Paper No. 1349
May 1984
JEL No. 220

This paper studies the impact on the savings rate and portfolio composition of individuals in different age groups and household types of broad changes in the economic and financial environment. Employing survey data, I cumulate household savings as increases in net transactable wealth observed across three benchmark periods: January–February 1962, the first half of 1970, and August–September 1977. This paper describes how saving rates and the allocation of accumulated savings among different financial and real estate assets varied with household circumstances during those periods. A sharp turnaround occurred between the 1960s and 1970s in the profiles of saving and homeownership for younger and older households.

Exchange Rates and Taxes

John H. Makin
Working Paper No. 1350
May 1984
JEL Nos. 310, 320

This paper demonstrates that different rates of taxation on interest income and gains on exchange may bias the results with regard to critical aspects of exchange rate behavior. It discusses two problems specifically. First, it shows that omission of tax considerations may bias tests of the uncovered interest parity condition toward acceptance of a "risk premium" hypothesis, conditional on efficiency in the exchange market. Second, it shows that a rational solution for the exchange rate makes the relationship between an exchange rate and its determinants conditional on two regimes: (1) tax rates on interest income and foreign exchange gains and losses at home and abroad; and (2) the degree of foreign exchange market intervention and sterilization of its effects on the monetary base practiced by central banks.

The Aftertax Rate of Return Affects Private Savings

Lawrence H. Summers
Working Paper No. 1351
May 1984
JEL No. 520

This paper reviews theoretical arguments and empirical evidence on the interest elasticity of savings. It concludes that there are strong theoretical reasons to expect an increase in aftertax rates of return to boost private savings. Moreover, the empirical methods used in most previous studies are likely to produce underestimates of the interest elasticity of savings. New evidence based on direct estimation of utility function parameters suggests that savings are likely to be highly interest elastic. The paper concludes by noting that not enough time has passed to properly evaluate the effects of the savings incentives contained in recent tax legislation.

Prospective Changes in Tax Law and the Value of Depreciable Real Estate

Patric H. Hendershott and **David C. Ling**
Working Paper No. 1352
May 1984
JEL No. 323

The Economic Recovery Tax Act of 1981 significantly reduced the tax on income-producing properties by accelerating depreciation on both new and, especially, existing properties. A partial reversal of the 1981 legislation appears likely. To provide some insight into the possible effects of a decrease in tax depreciation of income-producing properties, we analyze two potential tax changes: an increase from 15 to 20 years in the tax service lives of both new and existing properties, and an increase for existing properties only. We consider both residential and commercial/industrial properties.

The Economic Effects of Dividend Taxation

James M. Poterba and **Lawrence H. Summers**
Working Paper No. 1353
May 1984
JEL Nos. 521, 321, 323

This paper tests several competing hypotheses about the economic effects of taxing dividends. It employs

British data on security returns, dividend payout rates, and corporate investment because, unlike the United States, Britain has experienced several major dividend tax reforms in the last three decades. These tax changes provide an ideal natural experiment for analyzing the effects of dividend taxes. We compare three different views of how dividend taxes affect decisions by firms and their shareholders. We reject the "tax capitalization" view: that dividend taxes are nondistortionary lump-sum taxes on the owners of corporate capital. We also reject the hypothesis that firms pay dividends because marginal investors are effectively untaxed. We find that the traditional view, that dividend taxes constitute a "double tax" on corporate capital income, is most consistent with our empirical evidence. Our results suggest that dividend taxes reduce corporate investment and exacerbate distortions in the intersectoral and intertemporal allocation of capital.

Budget Deficits and Rates of Interest in the World Economy

Jacob A. Frenkel and **Assaf Razin**
Working Paper No. 1354
May 1984
JEL Nos. 431, 320

This paper deals with the international transmission of the effects of budget deficits on world rates of interest and spending. The model assumes a two-country world in which capital markets are integrated, individuals behave rationally, and the behavior of individuals and governments is governed by temporal and intertemporal budget constraints. Adopting Blanchard's formulation, we assume that since life has a finite probability, individuals behave as if their horizon were infinite. This formulation generates a simple pattern of aggregate behavior of the two-country world, and it assures that the model is not subject to the Ricardian proposition in which budget deficits do not matter.

We show that for a given time path of government spending, a budget deficit raises world rates of interest and domestic wealth while it lowers foreign wealth. Thus the deficit is transmitted negatively to the rest of the world. The channel of transmission is the world capital market and the negative transmission results from the higher rate of interest. The paper proceeds with an analysis of balanced-budget changes in government spending. It shows that a *transitory* current rise in government spending raises interest rates and lowers domestic and foreign wealth, while an expected future rise in government spending lowers interest rates, reduces the value of domestic wealth, and raises the value of foreign wealth. The effect of a *permanent* rise in government spending on the rate of interest depends on whether the domestic economy is a net saver or dissaver in the world economy, that is, whether it has a current account surplus or deficit. If the home country runs a current account surplus, then a rise in government spending raises world interest rates and lowers domestic and foreign wealth; if the home country runs a current account deficit, then a permanent balanced-budget rise in government spending lowers interest rates and domestic wealth and raises foreign wealth.

A Fiscal Framework for Analysis of Interest Rate Behavior in Open Economies

John H. Makin
Working Paper No. 1355
May 1984
JEL Nos. 310, 320

This paper derives a reduced-form expression for an interest rate in an open economy by incorporating aftertax covered interest parity conditions into a simple neoclassical macro model. The result clearly demonstrates that the relationship between an interest rate and the variables used to explain it is conditional on income tax rates at home and abroad and on the presence or absence of capital gains tax treatment of gains or losses on foreign exchange. Effects of nonindexation of tax treatment of depreciation and inventories may also play a role. Any change in effective tax rates over a sample period used to estimate interest rate (or exchange rate) equations may cause deterioration in the fit of a fixed-coefficient model. Efforts are underway to employ a random-coefficients approach to address this problem.

The Asset Price Approach to the Analysis of Capital Income Taxation

Lawrence H. Summers
Working Paper No. 1356
May 1984
JEL No. 520

This paper summarizes my recent research on the development of an asset price approach to the analysis of capital income taxation. While asset prices play a crucial role in many macroeconomic models, they have been subordinate in most previous efforts to study the effects of capital income taxation on economic behavior. I discuss a number of reasons for focusing on

the role of asset prices in analyzing questions of public finance. These include the role of asset prices in determining investment decisions and the fact that changes in asset prices are indicators of the horizontal and vertical equity effects of tax reforms. I also review recent empirical research in which information on asset prices is used to measure the effects of tax reforms on economic behavior and to distinguish between alternative models of the effects of capital income taxation. Finally I discuss directions for future research in public finance that focus on asset markets.

The Social Security Student Benefit Program and Family Decisions

Ronald G. Ehrenberg and **Rebecca A. Luzadis**
Working Paper No. 1357
May 1984
JEL Nos. 822, 915

In 1965 Congress established the Social Security Student Benefit Program that provided benefits for deceased, disabled, or retired workers' children who were enrolled in college full time and were not married, up until the semester when they turned age 22. The program grew to be a major source of financial aid; at its peak in FY81 it represented about 20 percent of all federal outlays on student assistance for higher education. The program was terminated for students newly entering college as of May 1, 1982.

Somewhat surprisingly, in contrast to the debate that accompanies most social programs, debate over the student benefit program focused on its costs and almost totally ignored the possible effects of the program. Virtually nothing is known about how the program influenced potential recipients' decisions to attend college, the quality of the education they received, the amount that recipients' families contributed to the students' educations, or recipients' in-school and summer employment. This paper seeks to shed insights into some of these effects using data from the Social Security Administration's *1973 Survey of Student Beneficiaries,* the only national survey of participants in the program.

The Degree of Fiscal Illusion in Interest Rates: Some Direct Estimates

Joe Peek and **James A. Wilcox**
Working Paper No. 1358
May 1984
JEL No. 310

This paper demonstrates why the procedures used in previous studies do not permit inference about the relationship between interest rates and taxes. We present a model that leads to direct estimates of the degree to which interest rates respond to changes in tax rates. The empirical results imply that the adjustment of taxable interest rates has been large enough to render aftertax yields impervious to tax rate changes. Further, tax-exempt yields are unaffected by changes in tax rates. Thus there is no evidence of fiscal illusion in interest rates.

Wage Bargaining, Labor Turnover, and the Business Cycle: A Model with Asymmetric Information

Motty Perry and **Gary Solon**
Working Paper No. 1359
May 1984
JEL No. 820

This paper presents a model of wage bargaining in which both the employer and employee are uncertain about each other's reservation wage. Under specified circumstances, the model's equilibrium is shown to involve unilateral wage setting and inefficient labor turnover. In addition, aggregate demand shocks affect the equilibrium in a way that produces procyclical quits and countercyclical layoffs. These results are obtained without resorting to assumptions of nominal wage rigidity, long-term contracting, or aggregate price misperceptions.

Concepts and Measures of Earnings Replacement during Retirement

Michael J. Boskin and **John B. Shoven**
Working Paper No. 1360
June 1984

This paper compares the well-being of the elderly, as indicated in the Retirement History Survey, with their previous levels of income and economic welfare. We calculate traditional replacement rates, but we also discuss a number of shortcomings of such measures. We modify these measures by examining career average, rather than peak, earnings; by adjusting for the fact that the incomes of the elderly are taxed more lightly than those of the nonelderly; and by recognizing that the elderly do not have dependent children, and that Social Security income in retirement is a safer source of income than earnings earlier in life. The fully adjusted measures of total income are at least as high for almost all classes of households in the survey as the preretirement career average earnings of the elderly.

Social Security and Household Portfolio Allocation

R. Glenn Hubbard
Working Paper No. 1361
June 1984

Entitlement to Social Security retirement benefits is a major component of aggregate household wealth. This paper focuses on the impact of Social Security annuities on the allocation of household portfolios, extending existing optimizing models of portfolio allocation to consider explicitly the role of Social Security. The model is implemented using cross-section data. The partial equilibrium impacts on portfolio choice and composition of changes in Social Security benefits are small but precisely measured. The general equilibrium impacts on asset markets of a Social Security policy change (focusing on links between Social Security and dynamic wealth accumulation and between Social Security benefits and private pension benefits) are generally much larger.

Estimation of a Simultaneous Model of Married Women's Labor Force Participation and Fertility in Urban Japan

Tadashi Yamada and **Tetsuji Yamada**
Working Paper No. 1362
June 1984
JEL No. 913

A strong and negative correlation between the participation of married women in the labor force and their fertility has been witnessed in Japan in past decades. Relative to the number of empirical studies of a traditional single equation of female labor supply, though, there exist few econometric studies that deal explicitly with a possible interdependency between the labor supply of married women and fertility behavior in urban Japan.

Using the recently published 1980 Population Census of Japan, we have estimated a simultaneous-equation model of married women's participation in the labor force and their fertility in urban Japan. Our model, based on a method of 2SLS, shows very satisfactory results to explain the negative correlation between those variables. Estimated labor supply elasticities for married women with respect to their fertility rates, wife's labor earnings, and male labor earnings are -0.67, 0.23, and -1.76 at the sample means, respectively. On the other hand, estimated elasticities of fertility with respect to married women's labor force participation and family income are -0.31 and 0.23, respectively. We find some of these elasticities for Japanese married women very comparable to those of married women in the United States.

Uncertain Lifetimes, Pensions, and Individual Saving

R. Glenn Hubbard
Working Paper No. 1363
June 1984
JEL No. 915

Attempts to measure the impacts of pensions on household saving have occupied much of the literature in empirical public finance over the past decade. The emphasis in this paper is on the annuity insurance aspects of Social Security and pensions. I put forth a simple life-cycle model to show that even an actuarially fair, fully funded Social Security system can reduce individual saving by more than the tax paid. Hence, previous partial equilibrium estimates of the impact of Social Security on saving, drawn solely from consideration of the intergenerational wealth transfer at the introduction of the system, are, if anything, too small.

The large partial equilibrium effects are mitigated when one considers initial endowments. To the extent that the introduction of Social Security reduces the size of unplanned bequests, its net effect on the consumption of subsequent generations is diminished.

The final sections of the paper extend the approach to private pensions and address empirical issues. Using a model specification from the literature for individual wealth accumulation, I interpret potential offsets according to the presence or absence of a bequest motive and according to the ability of individuals to adjust to their participation in private pensions to counteract involuntary changes in Social Security.

Post-Retirement Adjustments of Pension Benefits

Steven G. Allen, Robert L. Clark, and **Daniel A. Sumner**
Working Paper No. 1364
June 1984

This paper examines why pension plans have increased their liabilities by giving benefit increases to persons no longer working even though almost none of them was required to do so by any legally enforceable contract. In our model, workers and firms have implicit contracts under which post-retirement increases in benefits are purchased by workers through lower wages or initial benefits. Such arrangements permit both plans and workers to share the risk of uncertain rates of return. They also allow beneficiaries to invest at a higher net rate of return than they could obtain elsewhere because of tax advantages and, in large plans, economies of scale. We also discuss how post-retirement adjustments can be used to influence turnover.

We test some empirical implications of the model over a sample of beneficiaries of defined-benefit plans. Our major empirical findings are:

(1) There is strong evidence of compensating differentials in final salary and initial pension benefits for beneficiaries receiving post-retirement adjustments.

(2) Regardless of how the size of pension plans is measured (beneficiaries, participants, amount of benefits paid), large pension plans provide larger post-retirement benefit increases.

(3) Beneficiaries of collectively bargained plans are more likely to receive benefit increases and, among those receiving benefit increases, receive larger increases.

(4) Benefit increases are larger in percentage terms for those who have been retired the longest and for those with the most years of service.

Microproduction Functions Aren't Pretty: Firm-Level and Industry-Level Specification for Inputs and Outputs

Casey Ichniowski
Working Paper No. 1365
June 1984

This study documents extreme variations in productivity within a panel of eleven firms with the same narrowly defined industry classification. Many of the sources of this variation were identified in field investigations of each plant. These investigations in turn allowed for the development of detailed specifications for inputs and outputs using data collected from the sites. The empirical estimates show that, regardless of the precise functional form adopted, these detailed specifications, particularly those for output heterogeneity, are critical determinants of the performance of plant-level production functions. When the most detailed input and output specifications are used, 95 percent of the observed variation in plant production is explained. However, when the eleven firms are treated as an industry, less detailed specifications for inputs and outputs are shown to be more appropriate for explaining the variation in industry production.

Fuzzy Frontiers of Production: Evidence of Persistent Inefficiency in Safety Expenditures

Casey Ichniowski
Working Paper No. 1366
June 1984

This study documents a strong inverse relationship between accident rates and production in a sample of eleven firms with the same narrowly defined industry classification. Given the detailed set of input controls and controls for plant-specific and time-specific factors used in the analysis, the study argues that a theoretical framework that describes firms as operating on well-defined production frontiers is not adequate for providing an entirely accurate interpretation of the basic empirical finding. I develop three elaborations to the basic production frontier framework and use them to interpret the accident-productivity relationship.

Industrial Relations and Economic Performance: Grievances and Productivity

Casey Ichniowski
Working Paper No. 1367
June 1984

This study documents a significant inverse relationship between grievance rates and productivity. I argue that this significant inverse relationship reflects greater discrepancies between reported and effective labor hours as grievance rates increase. A grievance-free plant is approximately 1.3 percent more productive and up to 16.7 percent more profitable than when the plant operates with an average rate of grievances, so that industrial relations performance can critically influence the performance of the firm.

Ruling Out Productivity? Labor Contract Pages and Plant Performance

Casey Ichniowski
Working Paper No. 1368
June 1984

This study documents a strong inverse relationship between the number of pages in labor contracts in effect and the productivity observed in a sample of ten unionized plants. I argue that this relationship reflects the inhibiting effects on productivity of increases in the number and complexity of work rules. I also argue that subsequent research should try to improve the measurement of work rules by considering the substance of the rules and which parameters of a production function the rules are likely to affect.

An Examination of Multijurisdictional Corporate Income Taxes under Formula Apportionment

Roger H. Gordon and **John D. Wilson**
Working Paper No. 1369
June 1984
JEL Nos. 324, 325

This paper examines how corporate taxation of multijurisdictional firms using formula apportionment affects the incentives faced by individual firms and states. We find that formula apportionment creates distortions in factor prices that vary in general among firms within a state, and in such a way as often to put multistate firms at a competitive disadvantage. Formula apportionment also creates incentives for cross-hauling of output, with production in low tax-rate states more profitably sold in high tax-rate states, and vice-versa. Politically, formula apportionment appears to be very unstable—states face an incentive to shift to some other form of taxation. None of these problems exists when a corporate tax uses separate accounting.

Pension Plan Integration as Insurance against Social Security Risk

Robert C. Merton, Zvi Bodie, and **Alan J. Marcus**
Working Paper No. 1370
June 1984
JEL Nos. 915, 520

The manifest purposes of integrating an employer-provided pension plan with Social Security are: (1) to ensure the adequacy of retirement income for all covered employees; and (2) to ensure the equity of retirement income, defined as equal total replacement rates for all employees regardless of salary level. The focus of this paper, however, is on an equally important (and perhaps latent) consequence of integration: the alteration of the risk-bearing relationships among employees, employers, and the government vis-à-vis Social Security benefits. The main alteration is that the employer in effect insures his covered employees against adverse changes in their Social Security retirement benefit. Using the option-pricing methodology of modern contingent claims analysis, we develop a formal model to explore the quantitative aspects of this change.

While the focus of this analysis is on full integration, we do explicitly deal with various degrees of partial integration as it is currently practiced. We also analyze the effects of a switch from a nonintegrated to an equivalent-cost integrated plan when private benefits are fixed in nominal terms and when they are indexed. In this connection, we examine how integrated plans are affected when the sponsor makes ad hoc post-retirement benefit increases. We also consider the incentive effects on worker mobility of the adoption of integrated plans. The analysis is also used to highlight what we believe to be important unintended consequences of integrating pension plans with Social Security.

Inventory Fluctuations in the United States since 1929

Alan S. Blinder and **Douglas Holtz-Eakin**
Working Paper No. 1371
June 1984
JEL No. 130

It has been known for a long time that inventory fluctuations are of great importance in business cycles. But inventory fluctuations are fundamentally short-period phenomena. Consequently, annual data may shed relatively little light on the nature of inventory fluctuations; most of the "action" may be played out within the year. For this reason, economists know precious little about inventory behavior before World War II.

This paper seeks to lift this veil of ignorance in two ways. First, we create—from some admittedly incomplete and imperfect data—monthly time series on inventory holdings in manufacturing, durable manufacturing, and nondurable manufacturing. To our knowledge, these are the first such series ever made available. (The data are available on request.) Second, we apply to the prewar data certain statistical procedures and models that are in common use with postwar data. In this way, we can address the central issue of the paper: Has inventory behavior changed?

While we do not wish to overstate the case, we were struck more by the similarities in inventory behavior between the prewar and postwar periods than by the differences. But the paper displays the relevant stylized facts and regressions, and the reader can make up his or her own mind.

Bequests and Social Security with Uncertain Lifetimes

Andrew B. Abel
Working Paper No. 1372
June 1984
JEL Nos. 023, 111, 915

The fact that consumers do not know in advance when they will die affects both their consumption and

their portfolio decisions. In general, some consumers will end up leaving bequests at death, even if they have no bequest motive, simply because they happen to die at a time when they are holding wealth to provide for their future consumption. In the model in this paper, consumers who are otherwise identical die (randomly) at different ages and thus leave bequests of different sizes to their heirs. Therefore, there is intracohort variation in wealth and consumption even if all consumers have the same labor income, taxes and Social Security benefits. This paper presents explicit steady-state distributions for consumption and wealth. The introduction of an actuarially fair Social Security system reduces steady-state private wealth by more than one-for-one so that, even in a fully funded system, national wealth falls. In addition, all central moments of the steady-state distributions of consumption and wealth are reduced by actuarially fair Social Security.

Stabilization Policies and the Information Content of Real Wages

Joshua Aizenman
Working Paper No. 1373
June 1984
JEL No. 311

This paper compares the behavior of an economy subject to labor contracts with one in which the labor market clears as if in an auction. Such a comparison is intended to reveal the information content of real wages in a flexible economy. The analysis reveals two distinct costs inflicted by nominal contracts and demonstrates that optimal macro policies can eliminate one of them.

Excess Reserves in the Great Depression

James A. Wilcox
Working Paper No. 1374
June 1984
JEL No. 310

This paper assesses the extent to which government-administered financial shocks and lower interest rates can account for the massive accumulation of excess bank reserves in the Great Depression. Both factors are statistically significant. Financial shocks did exert a statistically detectable influence on the demand for excess reserves. But those shocks at best can account for a steplike increase in the level of reserves held, an increase that was completed in less than a year. Financial shocks can explain no more than 1 percent of the variation in excess reserves during the Great Depression. I demonstrate that the most statistically appropriate form of the demand function is one that flattened rapidly as interest rates fell. The fall in interest rates can account for 80 percent of the movement of excess reserves during the Great Depression.

Optimal Taxation by the Monetary Authority

Carl E. Walsh
Working Paper No. 1375
June 1984

Reserve requirements imposed against bank deposits, nominal interest payments on bank reserves (or on base money), and inflation can all be viewed as generating tax effects. Any analysis of optimal monetary policy in a steady-state equilibrium needs to consider the simultaneous choice of all the tax instruments controlled by the monetary authority. This paper carries out such an analysis. It shows that when the tax system is not indexed, the optimal nominal interest rate on the monetary authority's liabilities is likely to be zero. More important, in a nonindexed economy any discussion of the payment of interest on reserves and currency must take into account the nature of the tax system and the rate of inflation.

The Cyclical Behavior of Industrial Labor Markets: A Comparison of the Prewar and Postwar Eras

Ben S. Bernanke and **James L. Powell**
Working Paper No. 1376
June 1984
JEL Nos. 131, 824

This paper studies the cyclical behavior of a number of industrial labor markets of the prewar (1923–39) and postwar (1954–82) eras. In the spirit of Burns and Mitchell, we do not test a specific structural model of the labor market but instead concentrate on describing the qualitative features of the (monthly, industry-level) data.

The two principal questions we ask are: (1) How does labor input (as measured by the number of workers, the hours of work, and the intensity of utilization) vary over the cycle? (2) What is the cyclical behavior of labor compensation (as measured by real wages, product wages, and real weekly earnings)? We study these questions in both the frequency domain and the time domain.

Many of our findings simply reinforce, or perhaps refine, existing perceptions of cyclical labor market behavior. However, we do find some interesting differences between the prewar and postwar periods in the relative use of layoffs and short hours in downturns, and in the cyclical behavior of the real wage.

Estimated Trade-Offs between Unemployment and Inflation

Ray C. Fair
Working Paper No. 1377
June 1984
JEL No. 130

I estimate and test three models of price and wage behavior in this paper. In Model 1, the long-run trade-off between unemployment and inflation is in terms of price levels; in Model 2, the trade-off is in terms of rates of change; and in Model 3, there is no long-run trade-off. The evidence favors Model 1 over Models 2 and 3. The comparison between Models 2 and 3 is inconclusive. The short-run trade-offs are greater for Model 1 than for Models 2 and 3. The fact that Model 3 did not do particularly well is evidence against the Friedman–Phelps proposition of no long-run trade-off.

Business Cycle Analysis and Expectational Survey Data

Victor Zarnowitz
Working Paper No. 1378
June 1984
JEL Nos. 131, 132

What is the role of foresight, and the significance of the lack of foresight under uncertainty, in the theory of business cycles? What relevant evidence on these questions can be extracted from the survey data on agents' expectations and experts' forecasts? To provide some answers, I review the recent work in this area in the perspective of economic and doctrinal history. The paper begins with a discussion of the expectational aspects of theories of modern business cycles and a critique of the currently dominant approaches. There follow a summary of the evidence and some illustrations and implications for further analysis. Of the conclusions drawn, perhaps the most general one is that expectations matter a great deal but are not all-important. They may be rational in the sense of effectively using the limited available knowledge and information, but they are also diversified and not always self-validating or stabilizing.

The Reaction of Reduced-Form Coefficients to Regime Changes: The Case of Interest Rates

Joe Peek and **James A. Wilcox**
Working Paper No. 1379
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This study investigates whether the apparent intertemporal instability of a particular reduced-form equation (for interest rates) can be explained by changing government policy parameters, or regimes, and otherwise stable structural parameters. We hypothesize that major shifts in fiscal, monetary, and regulatory policy parameters have been important sources of that instability. Direct tests imply that reduced-form coefficients move by statistically significant and economically meaningful amounts in response to changes in policy parameters. Allowing for this systematic parameter variation produces greater stability in the remaining parameters. Furthermore, in-sample and out-of-sample forecasts from the proposed model outperform those from the nonresponsive parameter specification.

Money, the Rate of Devaluation, and Interest Rates in a Semi-Open Economy: Colombia, 1968–82

Sebastian Edwards
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In this paper, I develop an empirical model for analyzing the behavior of nominal interest rates in a *semi-open* economy. The model explicitly incorporates both the role of open economy factors (that is, world interest rates, expected rate of devaluation) and of domestic monetary conditions in explaining movement in interest rates. I test the model using quarterly data for Colombia, 1968–82. The results obtained indicate that the *semi-open* characterization is adequate for the case of Colombia, and that world interest rates, the rate of devaluation, and domestic monetary conditions have affected domestic nominal interest rates during the period under consideration. The results also indicate that unanticipated increases in the nominal quantity of money have exercised a negative effect on nominal interest rates in Colombia.

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